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DEPARTMENT OF DEFENSE CHEMICAL AND BIOLOGICAL DEFENSE PROGRAM

CBDP

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April 2009

I am pleased to present the Department of Defense (DoD) Joint Chemical and Biological Defense Program's (CBDP) 2009 Annual Report to Congress (ARC). This report details the progress made by the Department over the last year to protect our nation and allies from current and emerging threats posed by weapons of mass destruction (WMD). It also reviews current programs that provide Warfighters with the most superior chemical and biological (CB) defense training, equipment, and preparedness to ultimately achieve our CBDP vision of ensuring DoD operations are unconstrained by chemical, biological, radiological, and nuclear (CBRN) effects. Additionally, this year's report marks the second year of the transformation of the ARC to a more streamlined format. Information regarding quantities, characteristics, and capabilities of fielded CB defense equipment are available in the 2008 Research, Development, and Acquisition (RDA) Plan.

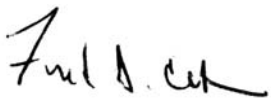
Congress, other federal agencies, academia, international partners, and the private sector all partner with the DoD CBDP to fulfill its mission to provide CBRN defense capabilities in support of the National Military Strategies. This mission is supported by our immediate goal to provide integrated, coordinated, and sustainable WMD solutions to the Warfighter; and our longer-term goal of advancing our defense capabilities to build readiness for current and future WMD challenges. We have structured our mission to be forward-thinking, responsive to Warfighter and national security needs, and streamlined with authority and accountability vested in specific executives.

During the past year, the DoD CBDP has:

- Enhanced program management methodologies to foster continuous process improvement and bring proven technologies to the Warfighter
- Improved the CBDP capability development process to ensure our national competitive advantage in WMD environments
- Implemented a new drug discovery and development capability that has streamlined the acquisition process for safe and effective medical products provided to the Warfighter
- Fielded 25 different systems and more than 1,000,000 pieces of equipment to the Services worldwide
- Published the Test and Evaluation (T&E) Infrastructure Investment Strategy and established collaboration between international T&E and modeling and simulation efforts, ensuring that T&E infrastructure is aligned with national priorities
- Enhanced and clarified the military's Joint combating CBRN and combating WMD operations by revising nine Joint publication documents
- Coordinated with international and interagency communities to facilitate interoperability between U.S. allies and maximize the effectiveness of CBDP capabilities.

As the DoD CBDP continues to maintain a competitive advantage by developing new defensive capabilities in anticipation of the continued evolution of WMD threats and potential threats, we depend on continued congressional support to sustain progress and successfully serve our nation, allies, and Warfighters.

With support of the President, the Secretary of Defense, and Congress, the DoD will continue to develop and resource an integrated CBDP that remains effective and continues to support our nation and allies through military readiness, operational success, and defense of our homeland.



Fred S. Celec
Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs

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Introduction

U.S. Armed Forces continue to be engaged in global operations across multiple theaters while simultaneously protecting the homeland. Our Service members face numerous challenges on the battlefield, but the threat posed by weapons of mass destruction (WMD) is among the most serious. The Chemical and Biological Defense Program (CBDP) provides support and world-class capabilities enabling U.S. Armed Forces to fight and win decisively in chemical, biological, radiological, and nuclear (CBRN) environments.

Since Congress established the CBDP in 1994, the Program has been an essential component of the Department of Defense's (DoD) efforts to integrate chemical and biological (CB) defense activities and sustain a competitive advantage. The CBDP supports a comprehensive strategic framework to improve CBRN defense preparedness, reduce risk to the Warfighter, and field the appropriate mix of capabilities for sustained military operations with minimum degradation of combat effectiveness attributed to CBRN hazards.

Research, development, and acquisition (RDA) of CB defense equipment and capabilities is executed by the DoD as a Joint Service Program in accordance with Title 50 United States Code (U.S.C.) 1522 (Public Law 103-160). The CBDP also addresses radiological and nuclear defense requirements; however, these activities are limited to specific types of radiation detection equipment, modeling and simulation (M&S) capabilities, and medical countermeasures to treat the physiological effects of radiological and nuclear source material exposure.

This 2009 CBDP Annual Report to Congress (ARC) provides an overview of FY 2008 accomplishments of the CBDP and is provided in accordance with Title 50 U.S.C. 1523. This report describes the progress made by the DoD to protect the Warfighter and the United States and its allies from the threat or actual use of WMD, and outlines achievements, initiatives, and innovations undertaken to identify and balance investment priorities against risks over time.

The CBDP researches, develops, and acquires integrated and interoperable CB defense capabilities to protect U.S. Armed Forces and enable the Warfighter to operate successfully in CBRN environments.

"There are few greater challenges than those posed by chemical, biological, and particularly nuclear weapons. Preventing the spread of these weapons, and their use, requires vigilance and obligates us to anticipate and counter threats."

2008 National Defense Strategy

Threat and the Global Security Environment

The threats faced on today's battlefield and in the homeland remain dynamic as a result of the expanding roster of antagonist nations, terrorist organizations, and other non-state actors possessing or seeking weapons with the capacity to inflict catastrophic damage (physical, economic, or psychological) on the United States and U.S. interests. The challenge of combating weapons of mass destruction (CWMD) is complicated by the ease with which knowledge related to WMD development could be disseminated, the increasingly dual-use nature of technologies, rapid technological advancements that continue to lower the threshold for acquiring WMD, and the development of novel threats through various techniques, including genetic engineering. Global security implications for the CBDP include the following:

- The United States will continue to be engaged in a struggle of evolving conflict against adversaries employing irregular, disruptive, and potentially catastrophic strategies—including the use of terror, asymmetric attacks, and WMD to challenge, marginalize, erode, and paralyze U.S. power.
- U.S. Armed Forces must be prepared to deal with a full spectrum of threats and must be able to operate in all WMD environments, unconstrained by CBRN effects.
- The DoD must be able to provide improved defensive equipment capabilities, trained personnel, and doctrine and logistical CBRN sustainment capabilities to prepare military units for immediate deployment from U.S. power projection infrastructure and rapid recovery and reset from operations within a CBRN environment.

> Failure to address the threat environment with the right mix of CBRN defense capabilities will increase risk to sustaining the nation's competitive advantage.

> Even inefficient dissemination of these materials, or a well-publicized hoax, could have a substantial psychological or economic impact.

The proliferation of CBRN weapons and the potential for a WMD attack remain direct threats to U.S. interests and allies worldwide. The Defense Intelligence Agency assesses that some of the countries that are still pursuing WMD programs will continue to try to improve their capabilities and level of self-sufficiency over the next decade. The intelligence community is especially concerned about the potential for terrorists to gain access to WMD-related materials or technology. The increased possibility of WMD attacks on the battlefield and at home underscores the need for a broad-spectrum approach to passive defense research and development (R&D).

Some state and non-state adversaries have seen chemical weapons (CW) and biological weapons (BW) as a potential means of achieving military or political objectives such as deterring the United States and its allies from operating in a region or influencing U.S. or allied courses of action. Additionally, as chemical, biological, and radiological (CBR) agents are relatively inexpensive to develop in comparison to the cost of developing conventional or nuclear capabilities, some terrorist groups see employing CBR materials as low-cost, high-impact options for achieving their goals. In September 2006, al-Qaeda-in-Iraq leader, Abu Ayyub al Masri, publicly called upon scientists to help the terrorist group develop such weapons. These efforts and similar efforts by other terrorist groups will persist for the foreseeable future.

Chemical Threat

While traditional, state-based, active chemical warfare programs have declined in recent years through Chemical Weapons Convention (CWC) stockpile reductions, the CW threat remains. The overall number of countries capable of producing chemical agents has grown and will continue to increase due to the availability of chemical production equipment and the globalization of the chemical industry. As technology dissemination progresses and dual-use equipment becomes increasingly available, the threat from CWs could become more diverse and more technically sophisticated. Although many states have remained focused on "traditional" chemical warfare agent (CWA) programs, others may be motivated to develop agents that are more difficult to detect, easier to disseminate, resistant to available medical countermeasures, or have increased lethality. The increased availability of related technologies, coupled with the relative ease of producing some chemical agents, has increased concern that CW production and employment may become more attractive to states or terrorist groups.

Toxic industrial chemicals (TIC) and toxic industrial materials (TIM) also pose a serious risk to U.S. Armed Forces and civilians because of their potential lethality. This, in combination with their availability, low cost, and the low security associated with some storage facilities, makes them attractive for terrorist use. Chlorine, phosgene, and organophosphate pesticides are all examples of readily available TICs and TIMs that could be used by hostile actors against U.S. interests. The fact that these materials are often transported in multi-ton shipments over public roads and railways makes them even more of a serious threat.

Between October 2006 and June 2007, Iraqi insurgents conducted multiple vehicle-borne improvised explosive device attacks employing industrial chlorine gas cylinders as improvised CWs. While these attacks showed little technical sophistication, they were initially successful in causing fear amongst the general populace and served as a clear sign that CW alternatives were being pursued by U.S. adversaries.

Biological Threat

Biological warfare and bioterrorism are expected to remain significant threats to the United States and its allies. BWs are easier and cheaper to develop than nuclear weapons and are potentially far more destructive than CWs to unprotected military forces or civilian populations. As a result, BWs have been viewed as a valuable tool in non-state arsenals.

It is anticipated that over the next decade, the threat from non-state use of BW is likely to become more complex due to the increased variety of agents and the sophistication of clandestine development programs. Additionally, advances in genetic engineering and other biotechnology could provide adversaries with the capability to modify biological agents by enhancing virulence, increasing stability and resistance, and minimizing detection—even creating a new synthetic biological agent.

While conventional weaponization and delivery of biological agents are difficult, even crude delivery systems can be an effective way of utilizing BWs, such as the anthrax letters of 2001. Additionally, adversaries may use human delivery systems by infecting themselves or others to spread certain biological agents within a civilian or military population.

Nuclear and Radiological Threat

Although the overall number of nuclear weapons continues to decline because of Russian and U.S. treaty commitments, the United States anticipates an increase in weapon numbers in China, India, and Pakistan. Motivated by economic and strategic interests, Russia and China (or political entities in each) and North Korea continue to supply technologies and components that are dual use and could support WMD and missile programs, especially in the Middle East and South Asia. Iran continues to develop its enrichment program in defiance of United Nations (U.N.) Security Council resolutions and also continues to build a heavy water reactor in Arak, which will be capable of producing plutonium that could be weaponized. While North Korea has halted portions of its nuclear program, it is possible that it has stockpiled several nuclear weapons from plutonium produced at Yongbyon.

Non-nuclear radiological dispersal devices (RDD) and radiological exposure devices (RED) pose a significant potential threat, especially in the hands of non-state groups. RDDs disperse radioactive material by conventional explosives or other mechanical means, whereas REDs passively expose people to ionizing radiation (usually without their knowledge). Contamination and recovery issues associated with operating in a radiological environment remain significant concerns for military operations and underscore the need for robust detection, protection, and decontamination systems.

Failure to address these challenges will increase the risk to national security. Sustaining and further improving the CBDP by investing in CBRN defense capabilities is a strategic imperative in today's global security environment.

Vision and Mission

The CBDP supports the development of capabilities required across many tasks shared between passive defense, consequence management, interdiction, and elimination operations. The CBDP also supports multiple national strategies that address the strategic environment for deterring and preventing adversary use of WMD. Specifically, the CBDP supports the *National Strategy to Combat Weapons of Mass Destruction (NSCWMD)*, which emphasizes that the gravest danger for the United States lies at the crossroads of radicalism and technology. The 2008 CBDP Strategic Plan leverages key elements drawn from 12 strategic plans both internal and external to the CBDP. Several relevant documents are listed below:

- *NSCWMD*
- *National Military Strategy to Combat Weapons of Mass Destruction (NMSCWMD)*
- *DoD Strategy for Homeland Defense and Civil Support*
- *2008 Chairman, Joint Chiefs of Staff's (CJCS) Posture Statement*
- *2006 Quadrennial Defense Review (QDR)* Report
- *Under Secretary of Defense for Acquisition, Technology and Logistics (USD(AT&L)) Implementation Plan.*

Key Organizational Relationships, Roles, and Responsibilities

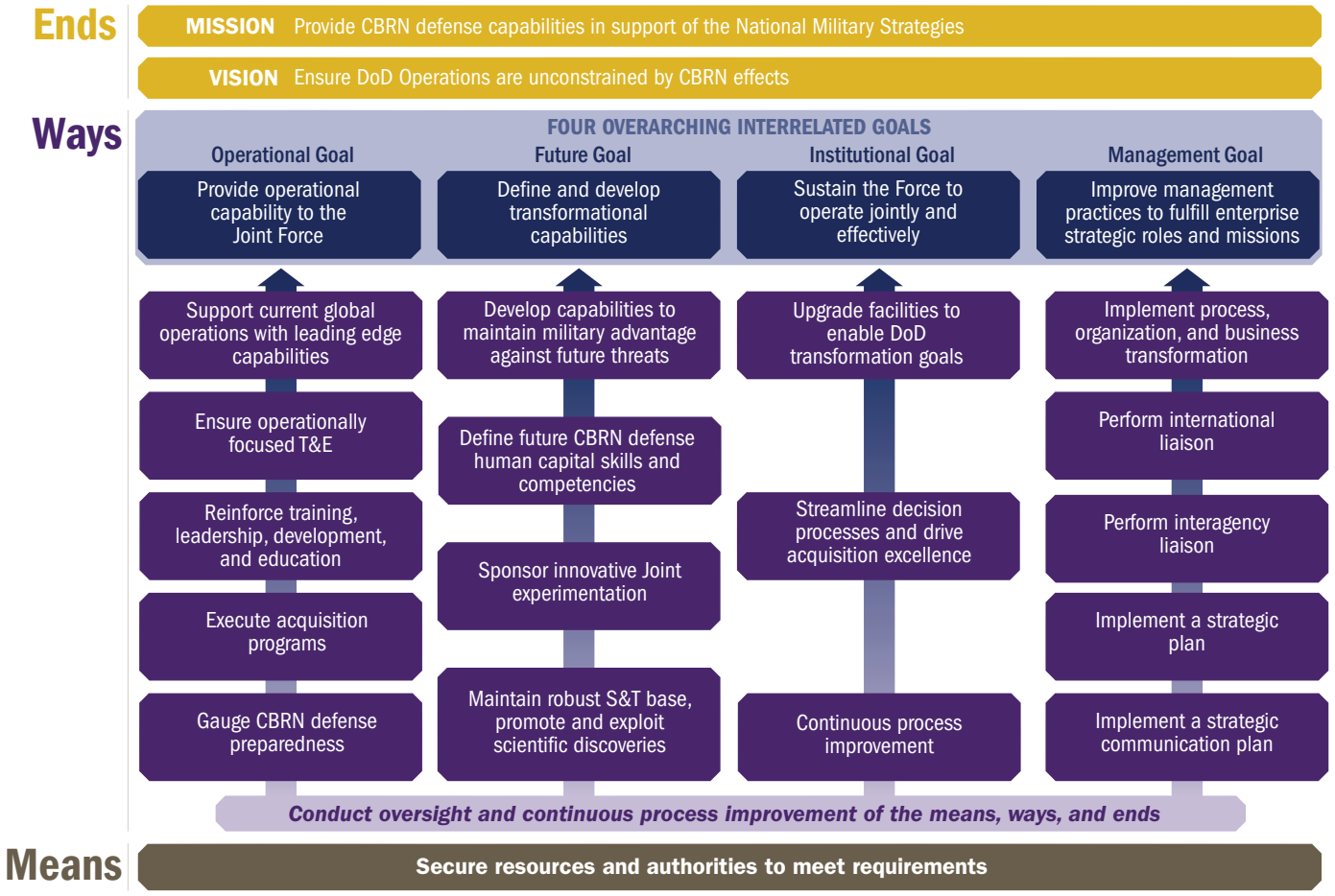
The overall vision of the CBDP, as stated in the 2008 CBDP Strategic Plan, is to ensure DoD operations are unconstrained by CBRN effects. The mission of the CBDP is to provide CBRN defense capabilities in support of the National Military Strategies. The CBDP vision and mission, or "ends," are supported by four overarching and interrelated goals based on the major defense challenges described in the current National Military Strategies. These goals combine to provide the essential integrated, coordinated, and sustainable CBRN materiel and non-materiel solutions to the Warfighter. The four strategic goals are supported by 17 strategic priorities, or "ways." The "means" represent the resources required for the Program to successfully attain its end state. The CBDP strategy map is illustrated in the figure below.

In accordance with Title 50 U.S.C. 1522, oversight of the CBDP is assigned to a single office within the Office of the Secretary of Defense (OSD)—the Office of the Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs (OATSD(NCB)).

Responsibilities within the CBDP are executed in accordance with Department of Defense Directive (DoDD) 5160.05E, *Roles and Responsibilities Associated with the CBDP*. DoDD 5160.05E updates and assigns responsibilities and functions associated with RDA of CBR defense materiel (medical defense and physical (non-medical) defense) required to support CWMD missions as set forth in the *NMSCWMD* and DoDD 2060.02, *DoD CWMD Policy*. DoDD 5160.05E also designates and defines the role of the Secretary of the Army as the DoD Executive Agent for the CBDP—pursuant to section 1522 of Title 50 U.S.C., and in accordance with DoDD 5101.1, *DoD Executive Agent*.

The CBDP recognizes that integration is the key to achieving the best efficiencies and effectiveness. Therefore, the CBDP Enterprise is organized to focus on policy and governance, planning and programming, military capability development, science and technology (S&T), advanced development and acquisition, testing and evaluation (T&E), and doctrine. Organizational relationships are established to ensure single decision authorities, effective coordination, integration of program efforts, and appropriate checks and balances. Roles and responsibilities of the primary offices supporting the CBDP are described in the table on the following page and are represented in the "CBDP Enterprise Organizational Roles & Responsibilities" figure on page 6.

CBDP Strategy Map



CBDP Organizational Roles and Responsibilities

Oversight

- Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (OUSD(AT&L)): Serves as the Principal Staff Assistant and advisor to the Secretary of Defense for all RDA matters relating to CBRN defense; exercises authority, direction, and control over the OATSD(NCB); and oversees DoD RDA programs to ensure they support CWMD policy efforts. The OUSD(AT&L) is the milestone decision authority (MDA) for the overall CBDP and key selected CB defense systems.
- OATSD(NCB): Coordinates and integrates the CBDP as a single responsible office within the OSD and executes Program oversight activities, related acquisition policy guidance, and interagency and international coordination. The OATSD(NCB) also provides oversight of funds allocation for CBDP defense-wide accounts.
- Office of the Deputy Assistant to the Secretary of Defense for Chemical and Biological Defense and Chemical Demilitarization Programs (ODATSD(CBD&CDP)): Responsible for overall coordination and integration of all CBDP activities and provides day-to-day oversight of the Program.

Program Integration

- Army as the Executive Agent: Serves as the MDA for CBRN defense programs as delegated by the OUSD(AT&L). Coordinates and integrates the Services' research, development, test, and evaluation (RDT&E) and acquisition requirements for DoD CBRN defense programs. Also reviews all CBDP funding requirements.
- Joint CBRN Defense Program Analysis and Integration Office (PAIO): Provides independent analysis and integration functions for the CBDP. Supports the Joint Requirements Office for Chemical, Biological, Radiological, and Nuclear Defense (JRO-CBRND)-led development of the CBDP Program Objective Memorandum (POM) and leads the development of budget submissions and change proposals. Also develops and maintains the CBDP RDA Plan.

Capability Development

- JRO-CBRND: Coordinates and integrates requirements and capability needs for all DoD CBRN defense programs, ensuring that Service and Combatant Command (COCOM) capability needs are promptly developed and approved. Also leads development of the CBDP POM Strategy, and supports the development of multi-Service and Joint CBRN defense doctrine, tactics, techniques, and procedures (TTP), and training. The JRO-CBRND works with the Force Structure, Resources, and Assessment Directorate (J-8) and the CJCS to coordinate and integrate capabilities for all DoD CBRN programs, ensuring that Service and COCOM capability needs are promptly developed, approved, and delivered to the Joint Warfighter.
- Joint Combat Developer for Experimentation for Chemical, Biological, Radiological, and Nuclear Defense (JCD-CBRND): Under the direction of the JRO-CBRND, coordinates and oversees Joint and multi-Service experiments used to validate the Joint integrating concept for CWMD by systematically exploring new and innovative combinations of medical and non-medical doctrine, organization, training, materiel, leadership and education, personnel, and facilities (DOTMLPF) capabilities. Located at the U.S. Army Maneuver Support Center (MANSCEN) in Fort Leonard Wood, MO, the JCD-CBRND leverages personnel, equipment, and facilities available through each Service and other government organizations to reduce costs, shorten timelines, and improve experimental designs.

Science and Technology

- Joint Science and Technology Office for Chemical and Biological Defense (JSTO-CBD)/Defense Threat Reduction Agency (DTRA): Manages CBDP S&T efforts in coordination with the Service laboratories, industry, academia, and other government agencies and laboratories. The JSTO-CBD develops and maintains CBDP medical and physical sciences (non-medical) S&T plans, and develops, coordinates, and transitions CBDP S&T medical and physical sciences technologies and associated CBDP T&E technology needs in response to validated and approved Joint military capability needs. The JSTO-CBD also manages the CBDP Advanced Concept Technology Demonstration (ACTD), Advanced Technology Demonstration (ATD), and Joint Capability Technology Demonstration (JCTD) processes and individual ACTDs/JCTDs as assigned by the USD(AT&L).

Acquisition

- Joint Program Executive Office for Chemical and Biological Defense (JPEO-CBD): Serves as the MDA for CB defense programs as delegated by the DoD Executive Agent for the CBDP. Provides centralized program management and Joint Service acquisition program integration for all assigned medical and non-medical programs. The JPEO-CBD has eight Joint Project Managers (JPM) that execute acquisition programs: JPM Biological Defense (JPM-BD), JPM Chemical and Biological Medical Systems (JPM-CBMS), JPM Collective Protection (JPM-ColPro), JPM Decontamination (JPM-Decon), JPM-Guardian, JPM Individual Protection (JPM-IP), JPM Information Systems (JPM-IS), and JPM NBC Contamination Avoidance (JPM-NBC CA). These JPMs direct RDA, procurement, fielding, and life cycle support of CB defense equipment and medical countermeasures.

Test and Evaluation

- T&E Office (TEO): Establishes test standards, processes, and procedures and oversees CBDP T&E infrastructure to ensure that adequate T&E is conducted for CBDP systems.

Training and Sustainment

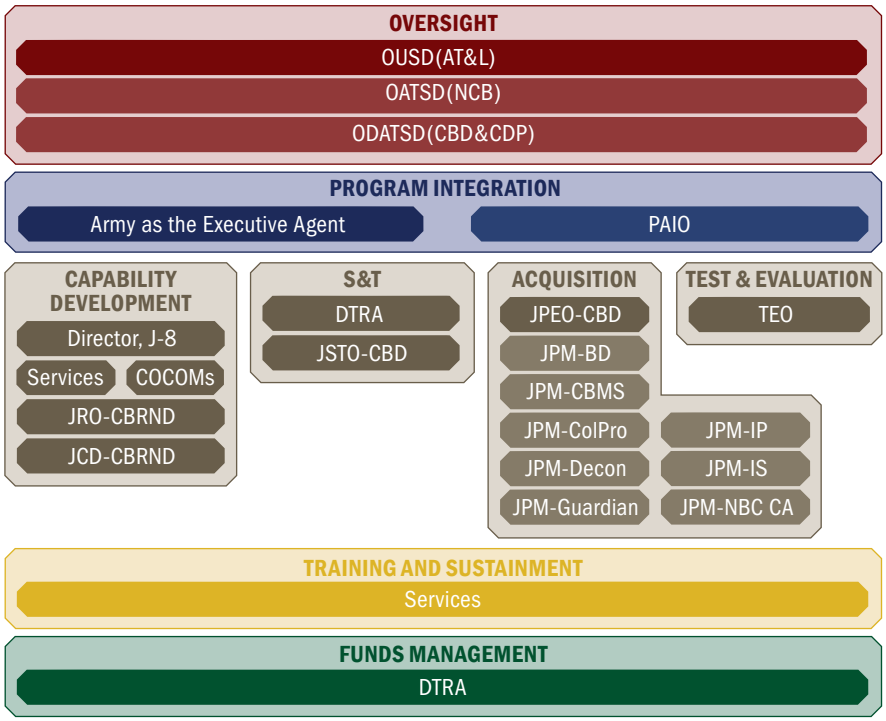
- The Services are responsible for organizing, training, equipping, and preparing their respective Forces to defend against the use and effects of WMD and maintain operational capability in the event of an attack; to restore essential government services affected by WMD use; and similarly, to respond to foreign requests for assistance. They also validate operational concepts and develop Service-sponsored CBRN defense capabilities documentation consistent with the Joint Capabilities Integration and Development System (JCIDS) process and the Joint CBRN Defense Modernization Plan. In addition, they support the development of Service annexes to Joint CBRN defense capability documents, and budget for the operations and sustainment (O&S) of CBRN defense equipment as appropriate.

Funds Management

- DTRA: Serves as the accountable official, providing funds management functions for the CBDP in the categories of RDT&E, procurement, and military construction (MILCON) under the direction and oversight of the ODATSD(CBD&CDP).

The CBDP continuously looks to improve its management practices and actively coordinates with other government agencies to ensure programs are well integrated to leverage resources and to eliminate duplication.

CBDP Enterprise Organizational Roles & Responsibilities



Innovation

The CBDP Enterprise is institutionalizing a mindset and culture that seeks innovation at every step. The Program will continue to build on current strengths to support the Warfighter in a time of urgent need while recognizing that the environment is constantly changing. Overarching risk guidance for the future will reduce, minimize, or negate the risk associated with changes in potentially catastrophic CBRN threats and ensure the processes and culture are in place to maintain this standard. The CBDP will continue to foster a culture that focuses on identifying, promoting, and integrating key non-materiel initiatives, which complement any technological advances.

Management Initiatives for 2008

In order to ensure that Program resources are utilized in the most effective and efficient manner possible, the ODATSD(CBD&CDP), in coordination with the OSD, established several strategies and plans that direct the execution of the CBDP in FY 2008 including:

- 2008 CBDP Strategic Plan
- DoDD 5160.05E
- The *Implementation Plan for Management of the CBDP* (will be replaced by Department of Defense Instruction (DoDI) 5160.xx, *Procedures for the Management of the DoD CBDP*, currently staffed for comment).

The U.S. National and Military Strategies direct how the CBDP focuses Program efforts and resources. In support of these strategies, the CBDP will:

- Continue to research, develop, and acquire transformational capabilities that provide forces, key personnel, and other assets with reliable prediction, detection, and warning capabilities to characterize CBRN threats
- Provide a more effective set of protective measures to minimize the effects of CB warfare agents and exposure to radiological and nuclear sources
- Emphasize broad-spectrum therapeutics and diagnostics that protect against emerging threats.

In April 2007, DoDD 2060.02, was approved to enhance coordination among DoD organizations tasked with various aspects of the CWMD mission. This directive assigns clear lines of responsibility and formalizes relationships among DoD components. The Deputy Secretary of Defense (DepSecDef) signed DoDD 5160.05E on October 9, 2008. This DoDD directs roles and responsibilities utilized within the CBDP. It will be complemented by its accompanying DoDI, which was sent for staffing in December 2008.

Accomplishments

- Integrated a DepSecDef-approved individual protection (IP) action plan. This effort chartered the Installation Protection Program (IPP) to include the Installation Protection Steering Group for the development of an "all-hazards" approach across the Services for continental United States (CONUS) and outside the continental United States (OCONUS) locations. Quarterly meetings have been conducted that produced incremental changes with semi-annual reports delivered to the DepSecDef, which identified critical issues and promulgated solutions.
- Developed and coordinated a DoD Non-Traditional Agent (NTA) Security Classification Guidance (SCG) document put forward as the basis for the Homeland Security Council national policy and SCG development. The final DoD NTA SCG was approved on July 1, 2008.
- In FY 2008, the CBDP developed and staffed DoDI 3150.09, *The CBRN Survivability Policy*. It was signed by the USD(AT&L) on September 9, 2008. DoDI 3150.09 implements processes and standards for improving survivability of all mission-critical systems operating in potentially contaminated CBRN environments. In addition, the Military Departments are required to provide an annual report on the CBRN survivability of their mission-critical systems.

The CBRN Defense Modernization Plan serves as the basis for modernizing DoD CBRN defensive capabilities and supports all aspects of Joint, multi-Service, and individual Service DOTMLPF requirements for CBRN defense in support of the Joint Force. In conjunction with the goals of the Modernization Plan, the Force Planning Construct (FPC) was updated in FY 2008 to reflect Service equipment requirements for each CBDP system/capability. The FPC defines the baseline force structure for equipment modernization in the FY 2010 to 2015 POM. Key modernization capability efforts identified in the Modernization Plan include:

- Broad spectrum medical countermeasures that provide protection against current and emerging biological threat agents
- Comprehensive defensive capabilities against NTAs
- CBRN reconnaissance and analytical equipment that can sample and characterize a wide variety of substances
- Sensors that can automatically detect a wide range of known and emerging threat agents
- Decontamination capabilities for personnel and mass casualty decontamination
- CBRN defensive equipment that is adaptable across the entire range of military operations
- Sufficient funding/procurement to modernize the specified Joint FPC.

On September 9, 2008 the USD(AT&L) signed DoDI 3150.09. The DoDI was developed by the DoD to answer Public Law 108-375, *The Ronald W. Reagan National Defense Authorization Act for FY 2005*. DoDI 3150.09 implements processes and standards for improving survivability of mission-critical systems operating in potentially contaminated CBRN environments. The Instruction requires the Services to provide a CBRN Mission-Critical Report (DD Form 2331). This report lists mission-critical systems and CBRN mission-critical systems and the status of their CBRN survivability as defined below:

- *Mission-Critical Systems:* A system whose operational effectiveness and operational suitability are essential to successful mission completion or to aggregate residual combat capability. If this system fails, the mission will likely not be completed. Such a system can be an auxiliary or supporting system, as well as a primary mission system.
- *CBRN Mission-Critical Systems:* A subset of mission-critical systems with operational contents requiring employment and survivability in a CBR or nuclear environment.

The ATSD(NCB) chairs CBRN Survivability Oversight Group to ensure compliance with DoDI 3150.09.

The CBDP continues to focus resources and efforts strategically by developing and implementing DoD issuances that outline comprehensive strategies, policies, and procedures.

Initiatives

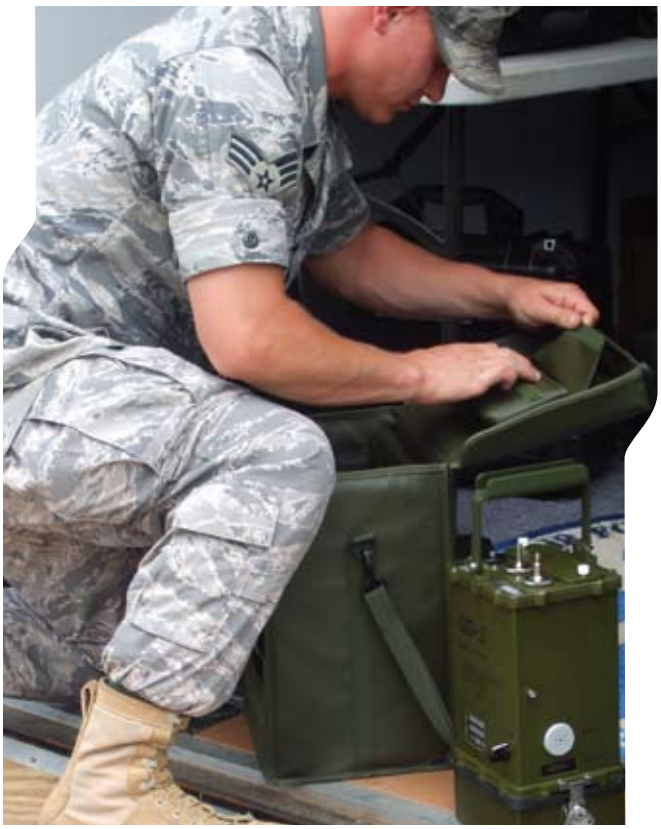
- **The CBDP is highlighting the importance of non-materiel solutions integration through the following initiatives:**
  - ***Infrastructure* – The CBDP commissioned a MILCON study to assess needed upgrades to modernize RDT&E laboratories and test range infrastructure. The CBDP is working to develop a MILCON Management Paper for formal concurrence that works to establish roles and responsibilities. This will lead to an update to the CBDP Program Strategy Guidance to be implemented in the FY 2012 to 2017 POM.**
  - ***Readiness* – The Preparedness Assessment methodology is designed as an assessment process and provides recommendations for leveraging the processes used by the Services and the CBDP to assess preparedness. The goal of this annual process is to provide an integrated CBDP preparedness picture by using existing data sources. These recommendations will improve the process and provide increased visibility and usability of preparedness information.**
  - ***Policy* – The CBDP will continue its efforts in the strategic planning arena by developing corresponding implementation and oversight plans that will both enable and monitor the progress the CBDP makes towards achieving strategic goals. The CBDP is developing a DoDI that will expand on the approved DoDD 5160.05E by codifying management and operating procedures within the Program.**
  - ***Jointness* – The CBDP is working to better integrate CBRN defense doctrine, training, leadership, and education (DTL&E) integration within the DoD. DTL&E are key non-materiel elements to achieving fully-integrated CBRN defense capabilities. Within the Department's transformation effort, consistent updating of doctrine and operational concepts while integrating training and education is essential to meeting new challenges to the Joint Force.**
- **Establishing a Capability Portfolio Management (CPM) process to collect available programmatic, financial, and performance data on all programs overseen by the CBDP. This information will help decision-makers integrate, synchronize, and coordinate DoD capability needs with current and planned DOTMLPF investments.**

Funding

In order to support the dynamic response of the CBDP to shifting threats, adequate funding and resources must be provided to address operational capability gaps—such as advanced S&T, systems acquisition, and fielding of procurement systems to meet updated FPC requirements and achieve modernization objectives.

The CBDP funds research to exploit leading edge technologies to ensure that U.S. Armed Forces are equipped with world-class capabilities to defend against CB threats through the far-term. This research also provides leading edge tools that will enhance CB defense capabilities for U.S. Armed Forces in all counterproliferation defense missions in the near-term, and start or continue procurement on a variety of CB defense systems.

O&S funding for CBRN defense materiel is not consolidated at the DoD level. The Services are responsible for separately funding replenishment and sustainment of CBRN defense secondary equipment items (e.g., consumables such as decontamination kits, detection kits, and filters). Depot maintenance and contractor logistics support for some low-density major items are also O&S-funded, and therefore not included in the Joint CBDP budget.



Management Assessment

The CBDP published the first two management documents required as the foundation for oversight in the Program. The first essential document is DoDD 5160.05E, which updates the outdated 1985 version with a new subject that addresses CBDP policy, roles, and responsibilities for RDA activities. The second document is the CBDP Strategic Plan, which is intended to influence ongoing near- and mid-term actions and provides the direction for the next ten to 15 years. This strategy portrays the first comprehensive, integrated roadmap for the CBDP Enterprise by outlining the overarching direction for the organization. Both efforts required consensus from all DoD stakeholders within the Program.

The DoD is currently implementing a Preparedness Assessment methodology to assess the preparedness of DoD CBRN defense, thus satisfying the intent of Congress as mandated by Title 50, U.S.C. sections 1522 and 1523. The Preparedness Assessment methodology, prepared by the PAIO in accordance with the FY 2008 to 2013 Program Strategy Guidance, outlines the processes to assess the overall Joint CBRN defense preparedness posture. The methodology is repeatable and designed to provide recommendations for leveraging the processes used by the Services and the CBDP to assess preparedness. The goal is to provide an integrated CBDP preparedness picture by using existing data sources (including the Defense Readiness Reporting System (DRRS), Joint Acquisition Chemical, Biological, Radiological, and Nuclear Knowledge System Reporting Warehouse (JACKS-RW), and JCIDS), process displays inputs, and metrics of the collected data that will lead to a reliable assessment tool for DoD leadership. The methodology is an annual process that will be refined through constructive input and support from stakeholders. The methodology is scheduled to provide an initial first report in FY 2009 and begin full reporting in FY 2010.

As part of a larger effort to continually improve business processes and support implementation of DoDD 7045.20, *CPM*, the ODATSD(CBD&CDP) began drafting a CPM process to collect available programmatic, financial, and performance data on all programs overseen by the CBDP. DoDD 7045.20 provides a methodology for integrating, synchronizing, and coordinating DoD capabilities needs with current and planned DOTMLPF investments to better inform decision making.

The DoD CBRN Defense DTL&E Strategic Plan, signed on December 5, 2008, was developed through continuous facilitation, coordination, and synchronization of existing oversight processes including assessing feedback, analyzing improvement processes to monitor results, and identifying areas requiring additional emphasis. CBRN Defense DTL&E is now being addressed within the JCIDS through the CWMD Working Group and the Protection Functional Capabilities Board (FCB) to ensure stakeholder participation. The Protection FCB has directed the use of the JCIDS and Joint training systems and the use of the Protection FCB and CWMD Working Group to validate gaps and work through DTL&E issues. The CWMD Passive Defense Capabilities Based Assessment (CBA) is being used to address gaps identified in the House of Representatives (H.R.) Report 109-452.

The CBDP International Oversight Panel (IOP) currently provides integration and oversight in the international arena for the CBDP. The IOP was established in FY 2007 and the charter has undergone review and revision. The Australia, Canada, United Kingdom, and the United States (AUSCANUKUS) Memorandum of Understanding on Research, Development, and Acquisition of Chemical, Biological, and Radiological Defence Materiel (CBR MOU) is a long standing agreement and must be reviewed every six months. A symposium with all participants has been completed. The CBDP has revised the CBR MOU strategy and roadmap to the year 2025, which enhances cooperative efforts to populate the matrix of member countries' capabilities, align national priorities to the maximum extent possible, and identify resulting gaps. The Program has developed new procedures for the completion of the CBR MOU for equipment and materiel transfer.

The Management area is assessed based on the status of DoD Issuances, Strategy and Guidance, and Methodologies, as shown in the table at right. Ratings were assigned to each document based on the following:

- **Green:** Document is complete or was completed during FY 2008
- **Yellow:** Document was not completed during FY 2008 and/or the document is experiencing delays
- **Red:** Document was not completed during FY 2008 and is experiencing significant issues and/or delays.

Management Assessment Documents

	Management Initiative Ratings	Rationale
DoD Issuances	DoDD 5160.05E	Complete
	DoDI 3150.09	Complete
	DoDI 5160.xx	Initiated, projected for completion in the fourth quarter of FY 2009.
Strategy & Guidance	CBDP Strategic Plan	Complete
	Procedures for CBR MOU for Equipment and Materiel Transfer	Complete
	CBR MOU Strategy and Roadmap	Complete
	DTL&E Strategic Plan	Complete
	Interagency Strategy Implementation Plan	Foundational work ongoing.
	Preparedness Assessment Methodology	Complete, implementation effort ongoing in second quarter of FY 2009.
Methodologies	CPM Process	Foundational work completed, expansion of the effort ongoing within the Program.

Overall Program Assessment

The following provides a review of the overall state of the CBDP. This assessment captures Program-wide successes and issues impacting the CBDP's overall health across capability development, S&T, acquisition and logistics, T&E, and management. Metrics for DTL&E and Interagency and International areas of the CBDP are captured in the Management Assessment. Individual metrics for these two Program elements will be developed for future reports.

Detailed assessments for each of these areas are presented in their respective sections in this report. These assessments use existing CBDP processes and leverage existing metrics and data to the greatest extent possible. The rating development process summarizes and integrates information of record from numerous data sources, and the results are verifiable by internal and external organizations and agencies, where applicable. The assessment supports Special Assistant for Chemical and Biological Defense and Chemical Demilitarization Programs (SA(CBD&CDP) efforts to accurately assess CBDP health and progress and summarizes Program status, overall CBDP performance, and cross-cutting and significant issues in FY 2008.

Each category assesses metrics based on the following criteria:

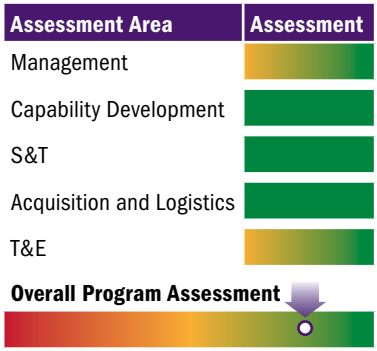
- **Green:** No cross-cutting issues
- **Yellow:** Cross-cutting issues with identified resolution within established processes
- **Red:** Critical issues that require Flag Officer/General Officer (FO/GO) resolution.

The following provides a brief overview of each section and their respective assessment ratings:

- ***Management*** is assessed as green/yellow. This rating is based on a review of ten management documents, of which seven are green, two are yellow, and one is red.
- ***Capability Development*** is assessed as green. This rating is based on a review of 55 FY 2008 JRO-CBRND JCIDS documents, of which 45 (or 82 percent) are green.
- ***S&T*** is assessed as green. This rating is based on the S&T Program's CB Directorate review of cost, schedule, and performance of Program portfolios. The Program is on track, with no projects being rated red. Three projects have yellow ratings in cost, schedule, and performance; however, the S&T Program has identified these as minor issues.
- ***Acquisition and Logistics*** is assessed as green. This rating is based on the JPEO-CBD's review of cost, schedule, and performance of 51 programs of record (POR).
- ***T&E*** is assessed as green/yellow. T&E infrastructure is improving based on investments made in FY 2006 through FY 2008; however, the CBDP must continue to ensure that infrastructure is up-to-date and aligned with National Priorities to support POR testing needs.

When averaged together, the above assessments produce an overall rating for the CBDP of green/yellow, as shown in the graphic at right.

Overall Program Assessment



The CBDP requires support from Congress to ensure continued progress in developing and fielding capabilities to protect U.S. Armed Forces against existing and future CBRN threats and meet critical ongoing operational needs in the following areas:

- Adequate resources to ensure procurement and fielding of improved defensive capabilities essential to the U.S. Armed Forces' ability to operate in any environment, unconstrained by the effects of WMD or CBRN contamination
- Stable funding to fully exploit the advanced S&T innovations necessary to successfully counter developing and future CB weapons
- Adequate long-term investment in infrastructure to enhance RDT&E capabilities, including modernization and construction of laboratories and test facilities to ensure development of advanced countermeasures against current and emerging CBRN threats
- Sufficient resources to support the transition to a new FPC, and the ability to maintain capabilities and Forces to wage multiple campaigns in overlapping timeframes.

Initiatives

The CBDP is a forward-looking organization and conducts continuous examination to improve processes and identify, prioritize, and resource capabilities-based requirements for the 21st century. In the near- to mid-term (FY 2010 to FY 2015), the CBDP will focus on the following:

- **Improving CBRN defense preparedness**
- **Reducing risk to the Warfighter**
- **Fielding a proper mix of capabilities to enable military operations**
- **Preparing for and meeting future threat(s).**

The CBDP strives to develop innovative technologies against a wide range of threats and reduce the impact of CB defense equipment on the Warfighter through integration with standard military hardware and rigorous evaluation of technology throughout the acquisition cycle.

Chemical and Biological Defense Program Capability Development

The CBDP's first step in enabling the Warfighter to operate successfully in CBRN environments is developing the proper mix of Joint capabilities for current military operations, while also preparing to combat future threats. As emphasized in the 2008 *National Defense Strategy*, countering asymmetric threats from prospective adversaries calls for better and more diverse capabilities, and the CBDP is leading the way in defining and meeting these needs.

The 2006 *QDR* outlines the DoD's FPC, which supports each mission assigned to the U. S. Armed Forces. To establish the CBRN defense capabilities needed to support the National Military Strategies, the JRO-CBRND partners with the Services and COCOMs to link programs to support the DoD's FPC. These missions include traditional combat, homeland defense, civil support, installation protection, and consequence management as well as special operations, counterterrorism, and security. The CBDP utilizes the DoD's FPC as the foundation for the identification and analysis of required capabilities to ensure that operations are unconstrained by CBRN effects.

The JRO-CBRND also incorporates other CBRN defense-specific plans that help shape capability development, such as the CBRN Overarching Operational Concept and the CBRN Defense Modernization Plan. Upon completion of this review, the JRO-CBRND identifies future operational capability needs with input from the Services, the Joint Staff-led Joint Warfighting Capability Assessments, and COCOMs. This cooperation ensures the DoD fields the proper mix of capabilities to enable military operations and constitutes the front-end analysis required to begin capability generation. The output of this analysis is the Joint Priority List, shown in the figure on page 15, which identifies and prioritizes capabilities across each of the core capability areas.

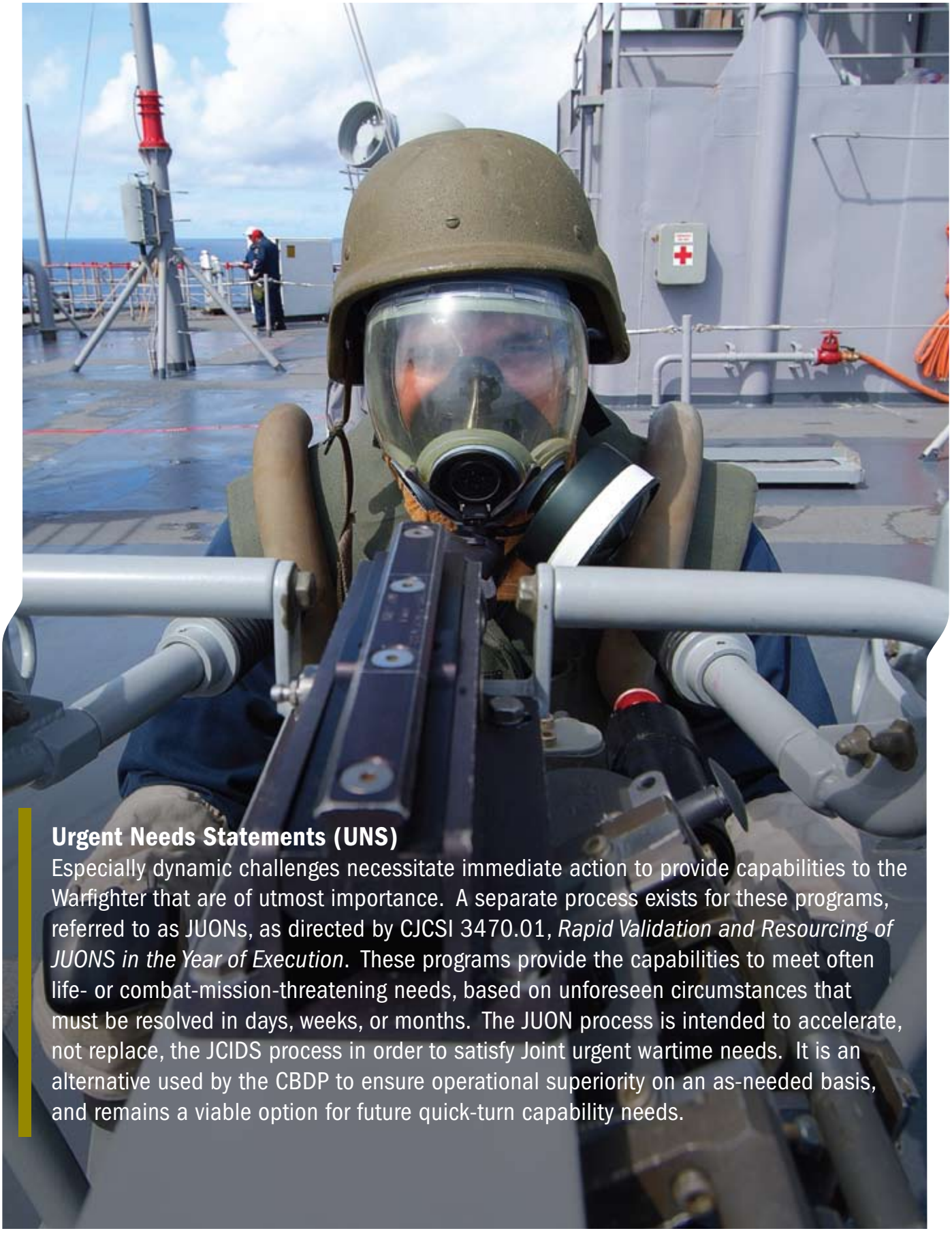
Initiative

In coordination with the White House Office of Science and Technology Policy (OSTP), the CBDP developed a technology roadmap that identifies CB programs from the DoD, Department of Homeland Security (DHS), and other government agencies to foster collaboration and understanding of potential synergies and vulnerabilities across the Enterprise.

After establishing capability goals as outlined in the CBDP mission and vision, the Program defines objectives to deliver these capabilities to the Warfighter. The J-8/JRO-CBRND work with the CJCS to represent the Services and COCOMs in the JCIDS, and act as their advocate for coordinating and integrating CBRN defense-approved operational capabilities. These organizations also manage the CBRN defense capabilities document approval process, which includes approving Service/COCOM-validated Joint capabilities documents and Service/COCOM-specific approved annexes, as per the Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3170.01 and Joint Requirements Oversight Council (JROC) Memorandum 163-02.

Accomplishment

Within the CBDP, the initial phase of the Joint Nuclear, Biological, and Chemical Reconnaissance System (JNBCRS) Increment II is the result of an approved and validated Joint Urgent Operational Needs Statement (JUONS). The Program will integrate commercial off-the-shelf (COTS) and government off-the-shelf (GOTS) equipment to meet the identified need for sampling, identification of, and protection from TICs. The JNBCRS Increment II, Phase I, has begun initial fielding and should be completely deployed in FY 2009.



Urgent Needs Statements (UNS)

Especially dynamic challenges necessitate immediate action to provide capabilities to the Warfighter that are of utmost importance. A separate process exists for these programs, referred to as JUONs, as directed by CJCSI 3470.01, *Rapid Validation and Resourcing of JUONS in the Year of Execution*. These programs provide the capabilities to meet often life- or combat-mission-threatening needs, based on unforeseen circumstances that must be resolved in days, weeks, or months. The JUON process is intended to accelerate, not replace, the JCIDS process in order to satisfy Joint urgent wartime needs. It is an alternative used by the CBDP to ensure operational superiority on an as-needed basis, and remains a viable option for future quick-turn capability needs.

Validation and Approval Process

The validation and approval process for CBDP capabilities follows the policies and principles set forth in the DoD 5000 series for the Defense Acquisition System. Operational capability needs are filled as the JRO-CBRND coordinates with the Services and COCOMs through CBAs, Joint Operating Concepts, Joint Functional Concepts, Joint Capability Areas, and Joint Integrating Concepts. CBAs consider solutions across the DOTMLPF spectrum to determine the best combination of materiel and/or non-materiel solutions to fill the capability gap. Should a materiel solution be identified, the JRO-CBRND, in coordination with the Services, develops capability documents for staffing and approval in accordance with the JCIDS process.

Upon entering the documentation process, the Joint Capabilities Document is drafted through the use of an integrated concept team that is composed of representatives of the Services, testing community, acquisition community, and all other stakeholders. Each of the Services is responsible for developing and approving annexes for Service-specific information.

Accomplishments

- **The Director, JRO-CBRND approved and validated the Joint Chemical, Biological, and Radiological Agent Water Monitor (JCBRAWM) Capability Development Document (CDD).**
- **The JRO-CBRND obtained JROC approval for a Capability Production Document (CPD) key performance parameter (KPP) reduction in the Joint Service Lightweight Stand-off Chemical Agent Detector (JSLSCAD) to meet an Army mission need. The JRO-CBRND also obtained JROC approval for the Joint Chemical Agent Detector (JCAD) CPD.**

Joint Priority List by Category of CBRN Defense Core Capability Areas

1. Chemical stand-off detection (SENSE)
2. Biological stand-off detection (SENSE)
3. Chemical point detection (SENSE)
4. Biological point detection (SENSE)
5. Integrated early warning (SHAPE)
6. Radiological stand-off detection (SENSE)
7. CBRN reconnaissance (SENSE)
8. Field analytics (SENSE)
9. Respiratory and ocular protection (SHIELD)
10. Biological prophylaxis (SHIELD)
11. Radiological point detection (SENSE)
12. Percutaneous protection (SHIELD)
13. Personnel decontamination (SUSTAIN)
14. Battle or operating environment management systems (SHAPE)
15. Chemical prophylaxis (SHIELD)
16. Battle or operating environment analysis (SHAPE)
17. Fixed-site collective protection (ColPro) (SHIELD)
18. Equipment decontamination (SUSTAIN)
19. Fixed-site decontamination and restoration (SUSTAIN)
20. Biological therapeutics (SUSTAIN)
21. Expeditionary ColPro (SHIELD)
22. Radiological prophylaxis (SHIELD)
23. Medical diagnosis (SENSE)
24. Chemical therapeutics (SUSTAIN)
25. Methods of control (SHAPE)
26. Medical surveillance (SHAPE)
27. Radiological therapeutics (SUSTAIN)
28. Hazardous waste control (SUSTAIN)
29. Remains disposition (SUSTAIN)

Joint Capabilities Integration and Development Process

Approved and validated CBDP capabilities are further defined, prioritized, assessed, and met through the JCIDS process described in CJCSI 3170.01F, *JCIDS*. The JCIDS process is initiated by the CBA process, which is broken down into three parts: functional area analysis, functional needs analysis, and functional solutions analysis. After capabilities have been established, these processes are conducted to define and prioritize capability needs to assess current capability proficiencies, gaps, and shortfalls, and to identify non-materiel and materiel solutions to fill those needs. While candidate programs are identified through the JCIDS process, they are managed through the acquisition life cycle, as described in DoDI 5000.02, *Operation of the Defense Acquisition System*.

There are eight mission areas and corresponding CBAs for CWMD as shown in the figure at right. The JRO-CBRND is currently leading an update to the 2005 Passive Defense CBA and finalized the Consequence Management CBA. These will be discussed in more detail in the following section.

CWMD Mission Areas

Mission Areas for Combating Weapons of Mass Destruction

- **Passive Defense** April 2004 to December 2005 *update now underway*
  - WMD Interdiction
  - WMD Elimination
- **Consequence Management** August 2006 to present
  - Active Defense
  - Offensive Operations
  - Threat Reduction Cooperation
  - Security Cooperation and Partner Activities

JRO-CBRND Lead | U.S. Strategic Command (USSTRATCOM) Lead

Innovation

The CBDP is continuously adopting refined JCIDS processes to comply with CJCS guidance to ensure the needs of the Warfighter are met. As the JCIDS process emphasizes more flexible, quick turnaround CBA processes, the CBDP has established frameworks and methodologies to allow efficient analysis, as demonstrated by the FY 2008 CBA updates.

Capability Refinement

In FY 2008, the JRO-CBRND began updating the CBA for CWMD passive defense that will be completed in June 2009. The original CWMD passive defense CBA was completed in December 2005. The objectives of the update are to:

- Identify the DoD's near- (2009 to 2014) and far- (2015 to 2027) term CBRN passive defense capabilities, gaps, and shortfalls
- Recommend DOTMLPF approaches to mitigate those gaps and shortfalls.

In this dynamic environment, it is essential to refine capabilities, current needs, and potential solutions to address current threats and sustain the national competitive advantage. Several developments since 2005 provided additional value to the CBA through the FY 2008 update. First, recent studies and analyses by the JRO-CBRND (e.g., the CWA Operational Challenge-Level Study) provided results that impact metrics used to assess CBDP capabilities. Second, additional CBDP-related capabilities were identified in other completed and on-going CBAs, including CWMD consequence management. Third, updated operational environments and capabilities were described by the USSTRATCOM-developed CWMD Joint Integrating Concept. Fourth, an additional conceptual basis for passive defense was provided in the Military Support to Stabilization, Security, Transformation, and Reconstruction Operations Joint Operating Concept. Finally, the interim Guidance for the Development of the Force provided priorities for the 2006 *QDR* 20-year planning period. The updated CBA reflects these revisions in requirements, scenarios, and priorities, while accomplishing the objectives previously defined in this section.

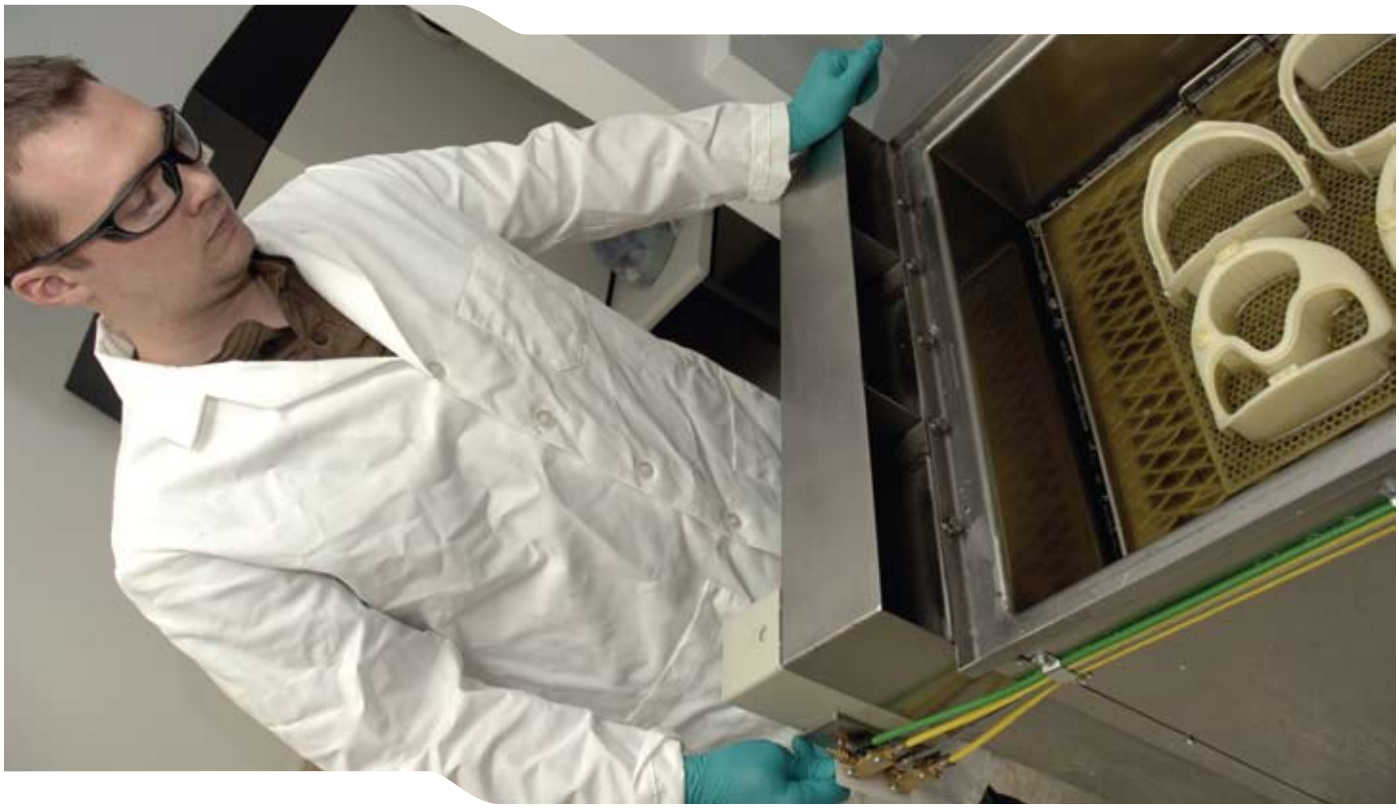
In FY 2008, the JRO-CBRND finalized the CBA for WMD consequence management that began in August 2006. The WMD Consequence Management CBA includes actions taken to reduce the effects of a WMD attack, involving TICs and TIMs, and assists in the restoration of essential operations and services at home and abroad. The assessment evaluated the capability proficiency of more than 55 tasks and is combined with a quantity assessment, such as the FPC, to guide consequence management capabilities development.

Accomplishment

The JRO-CBRND completed the CBA for WMD consequence management capabilities in accordance with the JCIDS process to guide future combat development.

Initiative

The CWMD passive defense CBA is being updated to refine capability needs, status, and potential solutions to address current threats and sustain the national competitive advantage.



Assessment

An evaluation of FY 2008 JRO-CBRND JCIDS documents shows that 50 of the 55 (90 percent) documents in place have no issues or an issue that can be resolved within the established process. Ratings were assigned to each JCIDS document based on the following:

- **Green:** No cross-cutting issues
- **Yellow:** Cross-cutting issues with identified resolution within established processes
- **Red:** Critical issues that require FO/GO resolution.

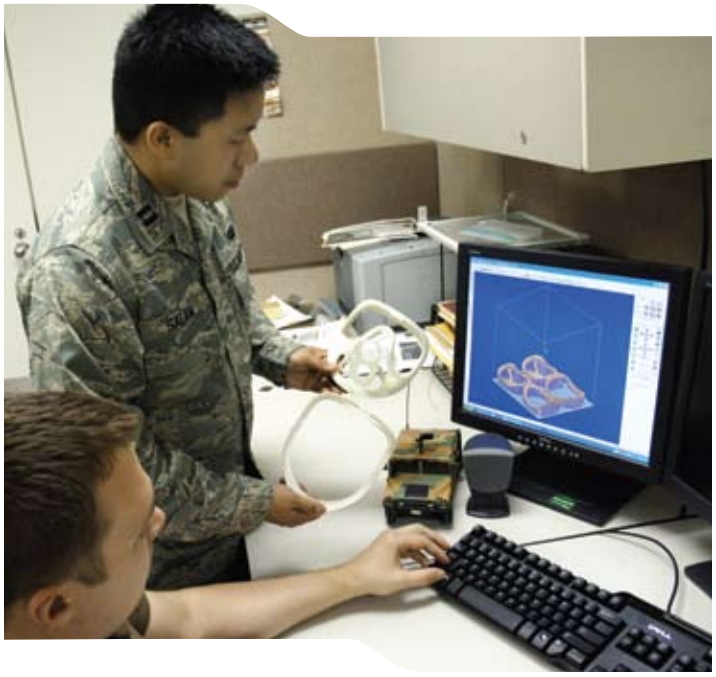
Of the PORs, four have had a JCIDS document with a critical issue that requires FO/GO resolution efforts. PORs with critical issues include: the Joint Service Transportable Decontamination System-Small Scale (JSTDS-SS) Increment I, Joint Biological Point Detection System (JBPDS), Human Remains Decontamination System (HRDS), Joint Service Aircrew Mask (JSAM), and Joint Operational Effects Federation (JOEF). The JSTDS-SS is resolving performance issues and has a CPD in coordination. The JBPDS required an additional system-level demonstration and a validation memo prior to the approval of the CPD in October 2008. The HRDS is adjusting its CPD to reflect the restructuring of the program into a Family of Systems (FoS). The JSAM is currently in redesign to separate the Apache variant, due to performance and budget issues. Finally, the JOEF is being restructured due to performance issues.

The overall health of the JRO-CBRND JCIDS documents are assessed within three operational categories: approved JCIDS documents, pending JCIDS documents, and JCIDS documents in development. As of FY 2008, 46 of the 55 POR JCIDS documents in place were approved, five were pending approval, and four were in development.

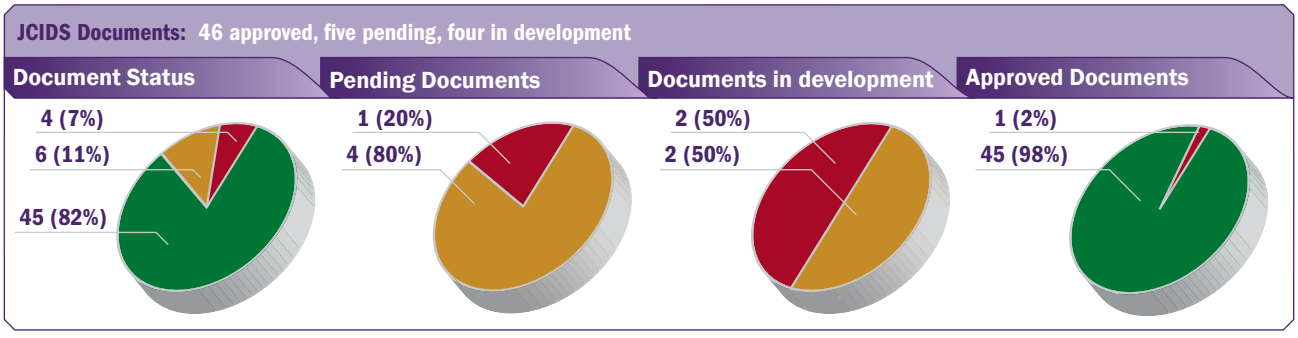
Of the 46 approved documents, 45 had no issues. The JBPDS issues are discussed above. Of the five pending documents, four (80 percent) had substantial issues having a resolution within the established processes, and one (20 percent) had critical issues requiring FO/GO resolution. Of the four POR documents in development, two (50 percent) had substantial issues having a resolution within the established processes and two (50 percent) had critical issues requiring FO/GO resolution.

Summary

The CBDP, through coordination and integration with the Services and COCOMs, develops dynamic Joint capabilities that reduce risk to the Warfighter and prepare the Joint Forces to meet future threats. The JRO-CBRND ensures these processes adhere to DoD 5000 Series and CJCSI 3170.01F guidance and serves as the CJCS' single source of expertise to address all issues involving CBRN defense. These capabilities are also continually examined and refined to ensure the most current CBRN defense capabilities, gaps, and shortfalls are being addressed. Teamwork is critical to generate, coordinate, and integrate these capabilities and maintain the national competitive advantage in CWMD.



JCIDS Documents



Science and Technology

The CBDP S&T Program addresses current and future threats and develops technology solutions to protect the Warfighter, ensuring that the United States is able to maintain a competitive advantage in CB defense. The JSTO-CBD is a leading authority in CB defense, with recognized expertise in the development of future technology solutions to safeguard the United States and its allies from WMD by providing capabilities to reduce, counter, and mitigate the effects of these threats.

The JSTO-CBD, as the focal point for S&T expertise, manages and integrates the discovery, development, demonstration, and transition of timely and effective CB defense solutions for the DoD. The JSTO-CBD performs technical, managerial, programmatic, and staff functions required to plan, integrate, and execute a comprehensive, innovative, and integrated R&D. The JSTO-CBD's projects and efforts address requirements spanning from near- to long-term. Project Managers balance technology push and requirements pull in a well-rounded approach to advance the gains of basic research, support existing acquisition programs, bridge the capability gaps identified by COCOMs and the JRO-CBRND, and explore the passive defense and consequence management ramifications of new and emerging threats.

Statement Regarding CB Defense Programs Involving Human Subjects: Although the DoD conducted tests involving the exposure of human subjects to CB agents in the past, all such tests and programs have been halted and disbanded. Human biological agent testing ended November 25, 1969 and human chemical agent testing ended July 25, 1975. No humans have been used as test subjects of any chemical or biological agent tests since that time.

Basic Research and Supporting Sciences

Basic research includes conducting fundamental research with broad, long-term potential applications in CB defense (medical and non-medical). The 2005 Report from the National Research Council's (NRC) Committee on DoD Basic Research Division on Engineering and Physical Science aligns a portion of the program with the DoD's definition of basic research and the recommendations in the section, *Assessment of DoD Basic Research*. The first recommendation of that assessment defines basic research as a "systematic study directed toward greater knowledge or understanding of the fundamental aspects of phenomena, and has the potential for broad, rather than specific, application." This program funds innovative scientific efforts across government, industry, and academia, potentially leading to high-payoff for CB defense applications in the physical and medical S&T functional capability areas' core programs.

The investment strategy includes needs-based research, basic research supporting the underlying fundamental science relevant to CB defense, and opportunities-based research to develop revolutionary S&T, which may enhance Warfighter protection and survivability with applicability across multiple capability areas. Efforts include nano-scale sciences, information sciences, surface and signature sciences, and chemical and biosciences that expand knowledge in threat agent biology and chemistry for developing physical and medical countermeasures.

Threat Agent Science

Threat agent science (TAS) research identifies and addresses gaps in understanding CB agents. Physiochemical and toxicological characterization of CWAs and biological warfare agents (BWA) provide detailed analyses of physiological response, environmental fate (stability and transport), and simulant development. These analyses facilitate detection, protection, and hazard mitigation (decontamination) countermeasures; improve Warfighter decision support tools; and provide a sound scientific basis for doctrine and policy development.

Initiatives

- The physiological response effort is establishing quantitative operational exposure standards for CW, developing substantiated dose-response relationships to CW hazards, and extending quantitative prediction of human hazard to agents.
- Agent Fate efforts will continue to establish a methodology to study percutaneous challenges, establish protocols to research NTA environmental fate and interactions, and ultimately understand and extend traditional CWA (neat and thickened) hazard characterization and predictive models to a set of operationally-relevant surfaces and exposure pathways. Particular emphasis will be placed on efforts encompassing agent characterization and simulant development and accelerated agent science.
- The JSTO-CBD works with the NRC postdoctoral program to find and fund candidates in DoD laboratories and Centers. This program is helping to educate new scientists about opportunities in the CB defense workforce.
- Implementing an integrated CB S&T Basic Research Program of physical and medical basic research. The new focus is to answer the science questions as well as identify new research, which will enhance efforts in the core program. This initiative will solicit ideas from academia, industry, and other scientific groups to collect current state-of-the-art technologies to revolutionize basic science as it relates to CB defense.

Accomplishment

TAS predictive modeling and testing efforts were instrumental in providing a more realistic estimate of inhalation vapor hazard persistence times. Agent Fate data and modeling efforts showed that inhalation vapor hazard could persist for days, rather than hours, so as a result, the originally-proposed estimates were discarded and the more realistic values were used in the Air Force Manual (AFMAN).

Medical

Medical S&T efforts have resulted in the development of pretreatment (prophylaxis) modalities that work against the effects of CBR agents as an effective countermeasure to CBR hazards. These efforts also focus on, and act as, methods for the timely diagnosis of specific exposures and post-exposure treatments that sustain individual health and force strength in the event of attack.

The Medical S&T Program has the following goals:

- Provide individual-level medical protection and prevention to preserve fighting strength
- Maintain technological capabilities to meet present requirements and counter future threats
- Provide medical management of CB casualties to enhance survivability and expedite and maximize return to duty

- Develop at least two broad-spectrum countermeasures leading to Investigational New Drugs (IND) within five years
- Develop genetic sequences for pertinent threats
- Provide a more expedient approach to drug development from discovery to fielding
- Develop bioinformatics and novel information platforms to analyze genes and proteins at the molecular level.

Research occurs in the areas shown in the table below.

Medical S&T Research Areas

Pretreatments
Conducts R&D of vaccines, medications, and technologies provided prior to potential exposure to CB agents. The goal is to reduce or entirely prevent adverse effects of exposure.
Diagnostics
Develops improved screening procedures and analytical methods to verify exposure/infection and determine the effects of exposure/infection to CWAs and BWAs.
Therapeutics
Provides medical post-exposure solutions for military requirements to sustain and protect the force in CB environments. Therapeutics deal primarily with medical countermeasures to bacterial, viral, toxin, and chemical agent exposure.
Medical Radiological Defense
Develops medical countermeasures (pretreatments and therapeutics) against radiological and nuclear threats. The goal is to develop prophylaxis (radioprotectants before radiation exposure) and therapeutics to mitigate complex post-radiation injuries.

Medical S&T efforts are designed to ensure that countermeasure candidates meet requirements for entry into the technology development phase and are consistent with technical information required for an IND application with the U.S. Food and Drug Administration (FDA). Maturing technologies are integrated into the product development team process to plan for appropriate systems acquisition. Medical S&T manages efforts under the medical-biological, medical-chemical, and medical-radiological defense portfolios.

Assessment methodologies enable threat evaluation and injury prediction. Medical pretreatment and therapeutic strategies reduce performance decrements, injuries, and deaths of military personnel in the field, enabling Warfighters to accomplish their missions, which reduces the need for medical resources and the probability of long-term health effects.

Medical Chemical Defense Research

The focus of the medical and chemical defense research area is to develop medical pretreatments, therapeutics, and diagnostics to treat the Warfighter for, and protect the Warfighter against, exposure to traditional (i.e., nerve and vesicant) and non-traditional chemical threats. Research areas of emphasis include: nerve agent bioscavengers, neurological therapeutics, cutaneous and ocular therapeutics, respiratory and systemic therapeutics, medical toxicology research, and chemical medical diagnostics. Ongoing chemical pretreatments research includes developing catalytic bioscavengers that provide protection against all organophosphate nerve agents. The research focus for chemical therapeutics is to identify and transition compounds that will ameliorate damage resulting from nerve agent intoxication. Chemical diagnostics research will provide accurate screening and diagnostic assays that support the FDA approval processes, develop reliable methods to indicate early skin exposure, determine alternate sample/extraction techniques in order to develop a field product to rapidly detect exposure, and develop a complimentary handheld analytic device to accurately identify chemical agents.

Innovations

- **Innovative, transformational S&T efforts involve advances in genomics, systems biology, and materials capable of sensing, protecting, and providing self-decontamination. Initiatives are utilizing the ability to manipulate matter at the atomic, molecular, and supramolecular levels in the length scale of one to 100 nm to understand and create useful materials, devices, and systems that exploit new properties, phenomena, and functions resulting from their small structure.**
- **Innovative concepts in medical countermeasures include developing multi-agent vaccines against viral and/or bacterial agents that will afford recipients protection against unique combinations of biological threat agents. For chemical agents, programs are directed towards transitioning small molecule countermeasures capable of protecting against and reversing nerve agent toxicity. Directed efforts in biological therapeutics will leverage cutting-edge technologies, such as nanotechnology and small molecule application, which will intervene in post-exposure effects of biological threat agents.**
- **An artificial human immune system currently transitioning to the medical S&T arena will allow evaluation of CB threats and potential countermeasures prior to employing an *in vivo* model. This innovative technology provides an automated, high-throughput, rapid, and predictive process, that reduces the number of laboratory animals required for screening and provides the opportunity for potentially significant savings in cost and development time.**

Medical Biological Defense Research

Biological defense research focuses on developing medical countermeasures to include pretreatments, therapeutics, and diagnostics effective against BWAs. Research activities concentrate on reducing the lethal and incapacitating effects of an agent and/or complementary vaccination strategies that are conducive to use in field operations. Research also aims to evaluate novel therapeutic and vaccine technologies, therapeutics, and vaccine candidates at an advanced stage of development; or therapeutics designed to reduce the morbidity and mortality associated with threat agent infection. Studies use appropriate *in silico*, *in vitro*, and *in vivo* animal models designed to support eventual FDA licensure of new non-licensed antimicrobial compounds and vaccines. Alternatively, new indications will be pursued for licensed products to use in the treatment and prophylaxes of BW casualties.

Medical Radiological Defense Research

The CBDP is working to prevent the risk of the Warfighter becoming a traumatic casualty due to radiation exposure. The Office of the Assistant Secretary of Defense for Health Affairs (OASD(HA)) acquired FDA-approved countermeasures to prevent the absorption of radiological agents and treat internal contamination with radiological agents by enhancing removal. At this time, no licensed or approved medical countermeasures to specifically reverse the effects of radiation exposure exist. As such, appropriately-applied advances in medical radiological countermeasures will significantly enhance the warfighting mission by sustaining unit effectiveness and preserving the Warfighter's efficacy. The focus of the medical radiological defense research area is to develop broad-spectrum medical radioprotectants (prophylactics) and post-irradiation therapeutics effective against acute radiation syndrome and the delayed effects of acute radiation exposure leading to chronic radiation damage (e.g., fibrosis and mutagenesis).

This effort seeks to expand the medical options available to prevent or mitigate radiation-induced injury with an emphasis on work at the advanced research level. Countermeasures under development will focus on the effective treatment of bone marrow and gastrointestinal injury from radiological and nuclear exposures that satisfy FDA requirements for licensure. Products of interest work through a variety of mechanisms including anti-oxidants, anti-apoptotic agents, decorporation agents, and organ system rescue using adult–derived stem cells. In addition, the program is interested in delivering an advanced dosimetry capability which will provide battlefield estimates of the radiation dose received in order to inform triage and treatment decisions. Multiple candidate systems are available including genetic and protein biomarkers for biodosimetry, as well as physical dosimetry technologies.

Initiatives

- Prochymal™, a human adult bone marrow stem cell product, was chosen as a medical countermeasure to radiological events. An IND was prepared and submitted to the FDA and Phase I clinical trials are scheduled to begin in FY 2009.
- The DoD and Department of Health and Human Services (DHHS) are coordinating their efforts to develop medical radiation countermeasures against Acute Radiation Syndrome. The DoD and DHHS each took one type of radiation injury to concentrate upon. The DoD is working on gastrointestinal countermeasures, while the DHHS is working on medical countermeasures for bone marrow injury.

Accomplishments

- Conducted pre-clinical studies of ST-246 generating important information that will support FDA approval.
- Identified novel small molecule inhibitors for botulinum neurotoxin (BoNT); a defined common physiological interdiction point for anthrax, plague, and tularemia; and a computational screen of 2,300,000 compounds against ricin.
- Developed a first-in-class Staphylococcal enterotoxin small molecule therapeutic, which is 50 percent protective in animal challenge models.
- Established a clinical research site in the Democratic Republic of the Congo to obtain human clinical samples of Monkeypox and Filovirus.
- Developed pharmacokinetic models of BoNT intoxication to establish a therapeutic window of opportunity.
- Delivered 19 assay design data packages to the Joint Biological Agent Identification and Diagnostic System (JBAIDS)/Critical Reagents Program (CRP).
- Provided the first quantitative assessments of low-level contact hazard for low volatility agents.
- Developed detailed quantitative models for the infectious process of anthrax, establishing the first low-level exposure risk models for rabbits and humans.
- Developed a deoxyribonucleic acid vaccine against Alphavirus (Western, Venezuelan, and Eastern Equine Encephalitis) delivered by electroporation which showed high efficacy in non-human primates.
- Developed five technology transition agreements (TTA) representing Filovirus vaccine platforms and an Alphavirus vaccine, both of which have been jointly approved by the JSTO-CBD/DTRA.
- Promethazine, an FDA-approved anticholinergic drug, was evaluated for use as a novel prophylaxis and treatment for nerve agent exposure. The protective benefit of promethazine against soman exposure was demonstrated through animal studies which examined survival, seizure activity, and brain pathology. Further studies are underway to expand these exciting findings which may lead to improved chemical medical countermeasures against nerve agents.
- A study was conducted to explore several different medical approaches to decrease wound healing time after exposure to sulfur mustard (HD). The results in animals showed that shallow Er:YAG laser debridement of HD wounds combined with the correct treatment adjunct is significantly more effective than no treatment. Additional research is underway to define optimal treatment modalities for HD skin wounds.

Transformational Medical Technologies Initiative

An independent program office, aligned with the JSTO-CBD for biological defense S&T efforts, manages the Transformational Medical Technologies Initiative (TMTI). This program office receives guidance from an executive office, which is made up of senior leadership from both the JPEO-CBD and JSTO-CBD. Program oversight is provided by the ODATSD(CBD&CDP).

The mission of the TMTI is to protect the Warfighter from conventional or genetically-engineered biological threats by accelerating the discovery and development of broad-spectrum countermeasures through the use of novel technology platforms and innovative management approaches. The overall goal is to provide an initial, integrated capability to rapidly respond to traditional, emerging, and genetically-modified biological threats. The current processes for identifying threats and developing/producing countermeasures are lengthy and expensive and do not address emerging diseases or engineered threats. The TMTI seeks to shorten the timeline for developing and manufacturing broad-spectrum countermeasures through the discovery of novel medical technologies, employing unorthodox scientific approaches, and streamlining drug development and DoD acquisition management practices.

In addition to developing broad-spectrum therapeutics for the DoD, another TMTI goal is to develop two (or more) platform technologies and establish a genetic sequencing capability. These elements will contribute significantly to the creation of an overarching rapid drug discovery and development capability concept (RD3C Concept) for the DoD. The RD3C Concept includes the following platform technologies: genetic sequencing, target identification, drug discovery, drug evaluation (which includes animal models), rapid manufacturing, and bio-informatics. Developing validated animal models from these platforms is a key component in demonstrating drug efficacy and is a critical element in the FDA drug-approval process. The TMTI is funding the R&D of animal models needed for the live-agent efficacy testing for broad-spectrum countermeasures. As developing validated animal models becomes the critical piece in producing effective broad-spectrum countermeasures, it is the integration of the aforementioned platform technologies that will have the greatest impact on rapidly identifying bio-threats and quickly developing effective countermeasures for the Warfighter.

Within its first three years, the TMTI has created a compound portfolio containing 18 potential INDs and a platform technology portfolio. The TMTI has partnered with other elements within the CBDP, DoD agencies, and other DoD laboratories for the development of some of these platform technologies.

Initiative

The TMTI plans to generate at least two IND submissions (one for hemorrhagic fever viruses and another for intracellular bacterial pathogens), developing at least two platform technologies (e.g., animal models and accelerated manufacturing), and establishing a genetic sequence capability for the DoD by FY 2011.

The discovery and early development of compounds exhibiting broad-spectrum efficacy against hemorrhagic fever viruses and intracellular bacterial pathogens has enabled the TMTI to move closer to its goal of producing licensed broad-spectrum therapeutics for the Warfighter. This year, two pre-IND packages were submitted to the FDA for therapeutics to the Ebola and Marburg viruses, and another pre-IND package for a compound against intracellular bacterial pathogens is nearing completion. Acceptance of these pre-IND submissions will allow the TMTI to meet its short-term goal of filing two broad spectrum INDs by FY 2011.

There is a high attrition rate for drugs as they progress through the drug development pipeline toward full licensure by the FDA. This reality necessitates that the TMTI's compound portfolio, which contains multiple IND candidates, receives adequate program funding to support moving the IND candidates through completion of phase I clinical studies (human safety). As part of the TMTI advanced development strategy for therapeutics, the TMTI has entered into an agreement with the U.S. Army Medical Research Institute for Infectious Diseases (USAMRIID) to implement a technology platform for the evaluation and re-purposing of FDA-approved drugs.

In the genetic sequencing area, the TMTI is on schedule to stand-up an initial genetic sequencing capability for the DoD by FY 2011. The TMTI has already demonstrated a genetic sequencing prototype capable of identifying pathogenic and genetically-modified bacteria; transforming a process that used to take days into hours. Additionally, the TMTI has created a genetic sequence database of bio-threat agents, which provides the capability to rapidly identify modified pathogens. This genetic sequence database will include the most prevalent strains for the list of bio-agents on the CJCS Class A Bio-Threat List.

Lastly, TMTI scientists have closely supported the development of an aggressive, resilient and highly efficient vaccine and monoclonal antibody manufacturing platform produced under the Defense Advanced Research Projects Agency's (DARPA) Accelerated Manufacture of Pharmaceuticals (AMP) Program. Over the last three years, representatives from the TMTI Program Office have been working with the DARPA to ensure that the AMP Program meets requirements necessary for the DoD to rapidly produce millions of doses of any medical countermeasures in less than 12 weeks, as opposed to the current production timelines of more than 36 months.

Accomplishment

The JSTO-CBD transitioned 13 technologies, submitted two pre-IND filings (with plans to submit the actual INDs in the second quarter of FY 2009 through one TMTI performer), and signed 22 TTAs. The USAMRIID, Edgewood Chemical Biological Center (ECBC), and Naval Medical Research Center (NMRC) supported building the initial foundation for a genetic sequencing capability within the DoD.

Non-Medical/Physical Science and Technology

The JSTO-CBD Physical S&T Program emphasizes innovation in managing multi-disciplinary, applied research, and advanced technology development to meet technology needs and capability gaps. The physical S&T portfolio ensures the effective transition of resulting technologies to Joint acquisition programs, and provides insights into policy and doctrine by maintaining a robust technology base (i.e., knowledge, research capabilities, and T&E methodologies).

Innovation

Efforts in physical countermeasures involve a focus on the convergence of nanotechnology, biotechnology, information technology, and cognitive sciences (NBIC) to make the use of CWAs or BWAs ineffectual. The vision of the future is an integrated protective ensemble based on the convergence of NBIC technologies. This ensemble will sense the presence of adverse substances, initiate countermeasures regardless of the origin or type of threat, and provide real-time battlefield awareness to the wearer and to the command nodes, with minimal burden on the individual Warfighter and the logistical infrastructure. The development of a technology roadmap that will plot the technical direction and help identify the technical priorities is underway.

The Physical S&T Program has the following goals:

- Meet the technology needs and capability gaps defined and prioritized by the JPEO-CBD and JRO-CBRND
- Emphasize innovation in multidisciplinary applied research by leveraging advances in strategic research
- Ensure effective and continual transition of resulting technologies to Joint acquisition programs
- Provide new insights into policy and doctrine
- Manage and balance risk with potential rewards against schedule.

The investment strategy is prioritized to meet the user's baseline capability requirements as directed by the JRO-CBRND and JPEO-CBD priority lists.

Accomplishment

Physical basic research developed a mechanistic tool for assessing sorptive capacities and rates of nano-porous materials, positively impacting the methodology for filter screening in the applied research area for the development of individual protective filters.

Detection

Detection research develops CB sensor components for stand-off applications, CB point identification, lightweight integrated detection and identification, and detection of CB contaminants in water to enable contamination avoidance. This research also emphasizes early-warning applications, which include capabilities for CB reconnaissance and situational awareness of the total battle space CB threat. For fixed sites where the Warfighter cannot avoid contamination, or for missions requiring operations in a contaminated environment—reconnaissance, detection, and identification are necessary for forces to assume the appropriate protective posture.

This research area also develops sensors for the individual Service member and systems capable of detecting multiple agents and characterizing new agents to provide situational awareness for battle space management decisions. The heightened operational tempo of future warning capabilities will reduce force degradation caused by CB-contaminated environments.

Accomplishments

- **Completed the development of a "decon wipe" for chemical agents on sensitive surfaces.**
- **Developed a new chlorine dioxide (ClO_2) formulation with enhanced broad-spectrum CB hazard reduction efficacy, which will lead to the development of environmentally safe for chemical agent removal.**
- **Completed first-level design parameters for NTA chamber construction.**
- **Developed next generation biological trigger technology to support the JBPDS and the Joint Biological Tactical Detection System (JBTDS) while meeting the high-performance and low-cost sides of the performance envelope.**

Protection and Hazard Mitigation

Protection and hazard mitigation research seeks to provide the capability to shield forces from CB hazards by preventing or reducing individual and collective exposures; therefore, the research prevents or minimizes negative physiological effects, protects critical equipment, and reduces hazards after employment of CB weapons to restore the capability of contaminated units. The protection and hazard mitigation capability area is divided into thrust areas that address the following specific aspects: integrated CB ensembles, deployable-ColPro, test methodologies, and hazard mitigation by decontamination or detoxification.

Initiative

The Lightweight Integrated CB Detection System and the Range Validation Test System—a 3-D tomography of a one kilometer square test grid for chemical vapors—are scheduled for transition in the second quarter of FY 2009.

Test, Demonstration, and Integration

Advanced technology development explores new operational concepts and the military utility of emerging S&T achievements as applied and demonstrated in operationally-relevant environments. These efforts use the tools and methodologies of ATDs and/or JCTDs to create an integrated technical capability suitable for operational demonstration and military utility assessments and feedback. The aim for this category's projects is to accelerate capabilities out of S&T and into the acquisition process, with the goal of demonstrating useful military capabilities at technology readiness level six or higher. The outcome is a robust understanding of capabilities and limitations with risks mitigated for transition to PORs. The capability prototypes assessed in a relevant environment represent a major step up in CB defense technology's demonstrated readiness for operational applications.

Accomplishments

- CBRN Unmanned Ground Reconnaissance ACTD:
  - Transitioned CBRN Unmanned Ground Vehicle (CUGV) technology to the JPM-NBC CA ahead of schedule and under budget.
  - Transitioned CUGV technology to the Product Manager Consequence Management, the Navy Explosive Ordnance Disposal Technology Division, the Future Combat System Small Unmanned Ground Vehicle, and to industry (iRobot Corp).
  - Identified new agent/simulant correlation and test methodology and procedures for optical detection of chemical contamination employing Raman Technology using the Joint Contaminated Surface Detector (JCSD).
- Expeditionary Biological Detection (EBD) ATD:
  - The EBD ATD is designed to support the JBTDS program and acquisition strategy. ATD candidates were selected for their applicability to the JBTDS and the ATD schedule will be bounded by the JBTDS acquisition timeline. A front end analysis compared existing DoD biological agent detection/identification systems against Marine Corps tactical biological detection needs and reviewed lessons learned from past experimentation. In FY 2008, the EBD ATD developed concept of operations (CONOPS) and TTPs for tactical biological surveillance; identified a suitable and effective capability set to address urgent needs from Marine Corps and the Navy Vessel Boarding Search and Seizure UNS; supported JBTDS CDD development with ATD lessons learned; accelerated the maturation of aerosol detection and sampling systems; and improved the understanding of biological M&S capabilities, limitations and infrastructure.
- Interagency Biological Restoration Demonstration (IBRD):
  - The IBRD program will provide a coordinated, systems approach to the recovery and restoration of wide urban areas, to include DoD infrastructures and high traffic areas (transit/transportation facilities) following the aerosol release of a biological agent. An up-front systems analysis and capability gap report was completed in FY 2008.

Information Systems Capability Development

This research area, in support of battle space information and related systems, provides information collection, fusion, and rapid-knowledge generation for all CBRN defense assets throughout the battle space. DoD advanced development programs and information systems technology research emphasizes expert scientific knowledge and insights, exploiting cutting-edge information system technologies and a variety of innovative software tools and products. By delivering capabilities that enable CBRN situational awareness and hazard warning and prediction within the battle space, these efforts support the integration of threat information, CBRN sensor and reconnaissance data, protective-posture data, environmental conditions, fusion of medical surveillance data, and informatics-related capabilities.

These advanced tools rapidly provide the Warfighter and decision-makers with the ability to quickly analyze courses of action before or during operations. Aspects of decision support for CBRN defense include Joint Force protection, restoration of operational tempo, casualty care treatment, medical countermeasure development, and intelligent resource-allocation support. Warning and reporting capabilities provide the hardware and software to connect detection systems into the overall command and control (C2) architecture. These S&T efforts also aid in the assessment of Joint and multi-Service doctrine, materiel development, and virtual equipment and countermeasure design. Information systems capability development supports Warfighter and battle staff training by employing larger conflict simulations, as well as performing support analyses of CBRN defense operations within the context of larger military operations in support of consequence management. These efforts also support simulation-based acquisition in the development of critical CBRN defense capabilities.

Accomplishments

- Integrated the initial source term estimation module into the Joint Effects Model (JEM), conducted validation field trials, and achieved advances in data fusion, virtual test environments, and prototype urban modeling capabilities. Delivered the initial TIC/TIM source modeling capability to the JEM.
- Delivered the following to the JOEF:
  - Legacy Consequence Management System Software
  - Tactical Aircraft Modeling System
  - Radiological operational effects and chemical improvised explosive device threats on mobile forces reports.
- Incorporated the initial nuclear, biological, and chemical (NBC) Casualty Response Estimation Support Tool casualty estimation into human effects models.

Innovation

Exploring the concept of an innovative central intelligent, autonomous information processing center. This capability could provide cognitive functions such as learning, memory, perception, prediction, and decision making; and seamless integration with the protective system providing understanding to mimic the molecular function, structure, process, and architectures with these synthetic materials.

Assessment

The JSTO-CBD conducts annual internal technical reviews of its projects and programs in order to assess scientific merit and programmatic applicability. Funded performers present projects in terms of goals, activities, and results to independent review panels comprised of members from government, industry, and academia subject matter experts (SME). These panels assess the projects for relevance and quality of effort. In addition, the JSTO-CBD receives quarterly and annual research reports from its funded efforts. These reports are evaluated for science quality and progress. The assessments are used in determining whether the project should be continued or whether funding should be ceased.

As part of its responsibility to manage the CBDP, the ODATSD(CBD&CDP) conducts quarterly and annual technical reviews of TMTI projects and programs using the Threat Reduction Advisory Committee (TRAC) CB Defense Panel. Funded performers present their projects in terms of goals, activities, and results to the TRAC CB panel, comprised of SMEs from government, industry, and academia. This panel assesses the projects for relevance and quality of efforts. Additional reviews are held monthly and on an ad hoc basis to assess the TMTI Program as well as the status of projects.

Project peer reviews for the TAS portfolio determined that the majority of the projects were extremely relevant to protecting the Warfighter. Several projects are being refocused to provide more scientifically-robust methodology. A few projects are being adapted to ensure maximum utility to the program.

The integrated physical and medical Basic Research Program reviews technical reports produced from project research and publications/presentations in peer-reviewed fora. The science is reviewed for quality, and performance is assessed against the objectives of the project to determine justification for the continuation of funding for the follow-on year.

Information Systems directly leveraged the annual science review to contribute to the current assessment process. Nearly concurrent with this review of ongoing S&T projects was the review of Phase I and Phase II new-start proposals. These two simultaneous evaluations facilitated a full and objective comparison of new and existing projects. Peer and SME project reviews (including participants from stakeholder communities such as acquisition and T&E) determined that the majority of ongoing projects were relevant and merited transition to acquisition programs in support of the Warfighter; however, some were deemed to be lower-priority than newer projects. The JOEF has been undergoing a requirements review, and as a result, adjustments to decision-making were made (i.e., project selection) to meet emerging requirements.

Medical S&T Program reviews determined that all projects within the portfolio are relevant to Warfighter needs. A review was conducted by the JRO-CBRND, Service representatives, and the advanced developer (JPEO-CBD), as well as a separate review by the JRO-CBRND and representatives from the Service and COCOMs. These separate reviews were intended to ascertain project applicability and relevance, and resulted in several projects being re-focused or re-scoped in order to more effectively address technology gaps.

An annual internal technical review of all physical S&T projects determined that the majority of the projects were directly relevant to protecting the Warfighter and resulted in technology transitions. Several projects received outstanding reviews for technology push, including efforts to develop next generation protective materials. The principal investigators for these scientific efforts were recognized as top scientists and researchers in the nation. Overall, the Physical S&T Program was reviewed and assessed as having a sound strategy for balancing investments between requirements pull and technology push.

The table below provides a snapshot assessment of the JSTO-CBD portfolios. Overall, the program is on track with no projects being rated red. The few projects in yellow status have cost, schedule, and/or performance issues, such as projected cost growth, which exceeds the baseline by no more than ten percent; significant schedule slips/delays that may have impacts to cost or performance; or only partial progress in achieving performance requirements.

S&T Portfolio Assessment Snapshot

Chemical & Biological Directorate Summary:
Portfolio Execution Status

CB Division	Cost (# of Projects)			Schedule (# of Projects)			Performance (# of Projects)		
Medical	253	9	0	240	22	0	255	7	0
TMTI	55	0	0	54	1	0	55	0	0
Physical	91	0	0	90	1	0	90	1	0
Basic and Supporting Sciences*	196	0	0	196	0	0	196	0	0
Information Systems Capability Development	59	0	0	59	0	0	59	0	0
TOTAL	**654**	**9**	**0**	**639**	**24**	**0**	**655**	**8**	**0**

**Includes TAS (6.2); excludes Medical 6.1 effort*

The commitment by the nation's top leadership to CB defense is clearly articulated in the President's *NMSCWMD* and the JRO-CBRND's Modernization Plan, 2008. The JSTO-CBD's approach to managing the DoD's CB defense S&T efforts in support of the National Military Strategies will continue to focus on the development and execution of a robust, integrated, and end-to-end CB defense S&T portfolio that provides capabilities to protect against, respond to, and enable recovery from CBR attacks. The JSTO-CBD will continue to engage a wide range of stakeholders as it develops specific strategic initiatives to meet its goals and objectives.

Acquisition & Logistics

The JPEO-CBD leads the development and fielding of integrated CBRN defense capabilities pursuant to the modernization strategies of the four CBRN defense operational elements (sense, shape, shield, and sustain). Each developmental program is based on the requirements of the Services and COCOMs, as articulated by the JRO-CBRND. As the MDA, the JPEO-CBD acts in concert with the Services/COCOMs in providing solutions to the Warfighter. This section provides the status of JPEO-CBD efforts, organized by the four CBRN defense operational elements plus the disciplines of medical, consequence management, major defense acquisition programs (MDAP), and software support activity (SSA).

Four CBRN defense capability areas categorize the capabilities needed for accomplishing all phases of a Joint CBRN defense operation—sense, shape, shield, and sustain, as detailed in the figure below.

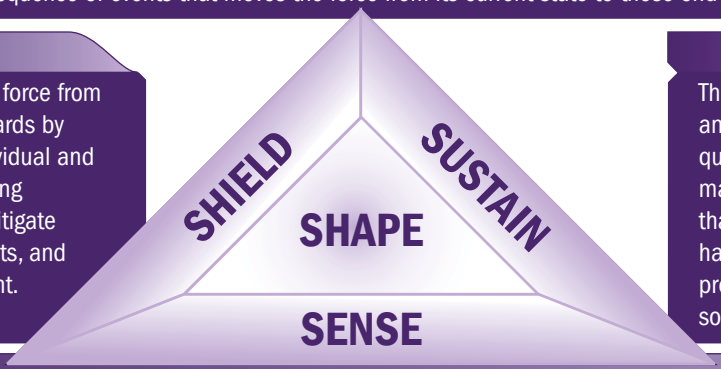
CBRN Defense Capabilities

SHAPE

Provide the ability to characterize the CBRN hazard to the force commander. Develop a clear understanding of the current and predicted CBRN situation; collect, query, and assimilate information from sensors, intelligence, medical, etc. in real time to inform personnel and provide actual and potential impacts of CBRN hazards. Envision critical SENSE, SHIELD, and SUSTAIN end states (preparation for operations). Visualize the sequence of events that moves the force from its current state to those end states.

SHIELD

The capability to shield the force from harm caused by CBRN hazards by preventing or reducing individual and collective exposures, applying prophylaxis to prevent or mitigate negative physiological effects, and protecting critical equipment.



SUSTAIN

The ability to conduct decontamination and medical actions that enable the quick restoration of combat power; maintain/recover essential functions that are free from the effects of CBRN hazards; and facilitate the return to pre-incident operational capability as soon as possible.

SENSE

The capability to continually provide the information about the CBRN situation at a time and place by detecting, identifying, and quantifying CBRN hazards in air, water, on land, on personnel, equipment or facilities. This capability includes detecting, identifying, and quantifying those CBRN hazards in all physical states (solid, liquid, gas).

Sense

The primary role of sense capabilities is to provide CBRN detection and identification to support decision processes of Joint Warfighters to mitigate the effects of CBRN events. The JPEO-CBD's JPM-NBC CA develops and integrates CBRN sensors for point detection (immediate), stand-off detection (at a distance), and early-warning applications for use in reconnaissance, detection, and identification. The currently-fielded chemical point detection systems are the M22 Automatic Chemical Agent Detector and Alarm (ACADA), M8A1 Automatic Chemical Agent Alarm, Improved Chemical Agent Monitor (ICAM), Improved Point Detection System, M8 and M9 paper, M256A1 kit, M18A2 and M18A3 kits, JCBRAWM, and M72 water testing kit. Recently, the DoD began transitioning to a new product, the JCAD, which will provide improved detection and identification capability at half the cost, a tenth of the weight, and about one quarter the size of the M22 ACADA.

The JSLSCAD is the currently-fielded chemical stand-off detection capability. The JPEO-CBD will field the JSLSCAD as a sensor on the Army's Stryker Nuclear, Biological and Chemical Reconnaissance Vehicle (NBCRV). The NBCRV will be able to detect and collect CB contamination in its immediate environment, on-the-move, through point detection (i.e., the CB mass spectrometer and JBPDS), and at a distance through the use of the JSLSCAD stand-off detector.

Also, with respect to CB reconnaissance, the JNBCRS Increment II will provide a CBRN detection and identification reconnaissance system and dismounted reconnaissance capability to the Warfighter, consisting of mission-essential sets, kits, and outfits tailored to Service needs with both COTS/GOTS handheld equipment. The JNBCRS Increment II will provide detection, presumptive identification, sample collection, marking, and immediate reporting of standard NBC hazards, to include hazardous industrial materials.

The JPM-BD develops point, stand-off, and tactical sensors for the Joint Services. This capability is critical to U.S. Armed Forces' operations in regions where the threat of BW-use is a concern. Point detection systems are deployed worldwide to counter the threat of BWAs. Current detectors for point detection and identification are the Joint Portal Shield (JPS) system and the JBPDS. The JPM-BD has 314 JPS systems fielded, as well as 496 JBPDS systems, including 29 systems integrated on the Army Stryker platform. Additionally, the JPM-BD has 21 JBPDS systems deployed on Navy platforms. The JPS is used to protect high-value fixed assets, while the JBPDS is the first automated system to routinely monitor the air for biological agents and provide presumptive identification for up to ten agents via immunoassay tickets. With respect to detection at a distance, the Joint Biological Standoff Detection System is the first biological standoff detector of its kind in the world. The system will be capable of providing standoff detection, ranging, tracking, and discrimination (manmade versus natural occurring aerosols) of biological warfare aerosol clouds for advanced warning, reporting, and protection.

Accomplishments

- Programs under the JPM-NBC CA have met KPPs and continue to progress along the JCIDS development life cycle. Four sense programs have moved into either the low rate initial production (LRIP) or full rate production (FRP) in FY 2008. The JCAD Increment I, provides chemical point detection. Two other programs address the Warfighter CWA and/or BWA point detection (JCBRAWM and JBPDS) needs, and one program addresses the capability shortfall of dismounted CBRN reconnaissance – the JNBCRS Increment II. The JBPDS, has met all its KPPs, and continues to progress along the JCIDS development life cycle in support of a FY 2009 FRP decision.
- The Navy now has the capability to identify and quantify CBRN hazards afloat via the JBAIDS.
- The JCAD Increment I is ground-use-functional to about 8,000 feet. Full production of 54,000 units has begun with the first Air Force buy to include 872 units under LRIP and 5,491 units under FRP. The JCAD is anticipated to fully replace the existing M22 and ICAM detectors.

Initiatives

- The Office of the Chief of Naval Operations and the Fleet continue to upgrade CBRN sensor packages onboard surface ships. Plans are underway to integrate a full suite of interior chemical detection sensors in the new DDG-1000 ZUMWALT class, allowing this class to be the first mounting both exterior and interior sensing equipment.
- The JCAD Increment II (development in FY 2010 to 2012) is to be effective up to 15,000 feet with the ability to detect and alert crews of lower concentrations of chemicals. Because JCAD Increment II is internally powered, it can be placed directly on pallets with no aircraft modifications.
- The Commander, Third Fleet (C3F) is the Operational Exercise Manager for the Weapons of Mass Destruction Aerial Collection System (WACS) ATD. A continuation of the Biological Aerial Collection System ATD, WACS is investigating the feasibility of using unmanned aerial vehicles with CBRN detectors for battle damage assessment on a WMD site. The goal is to determine if a release has occurred as a result of the strike.

Shape

The shape capabilities will deliver the means to characterize CBRN hazards to the Joint Forces Command (JFCOM). CBRN hazard characterization is the process by which the JFCOM develops a clear understanding of the current and predicted CBRN situation; envisions critical contamination avoidance, protection, and restoration end states; and visualizes the sequence of events that moves the Joint Force from its current state to those end states. This Warfighter capability will be delivered by three integrated interoperable/net-centric information system PORs:

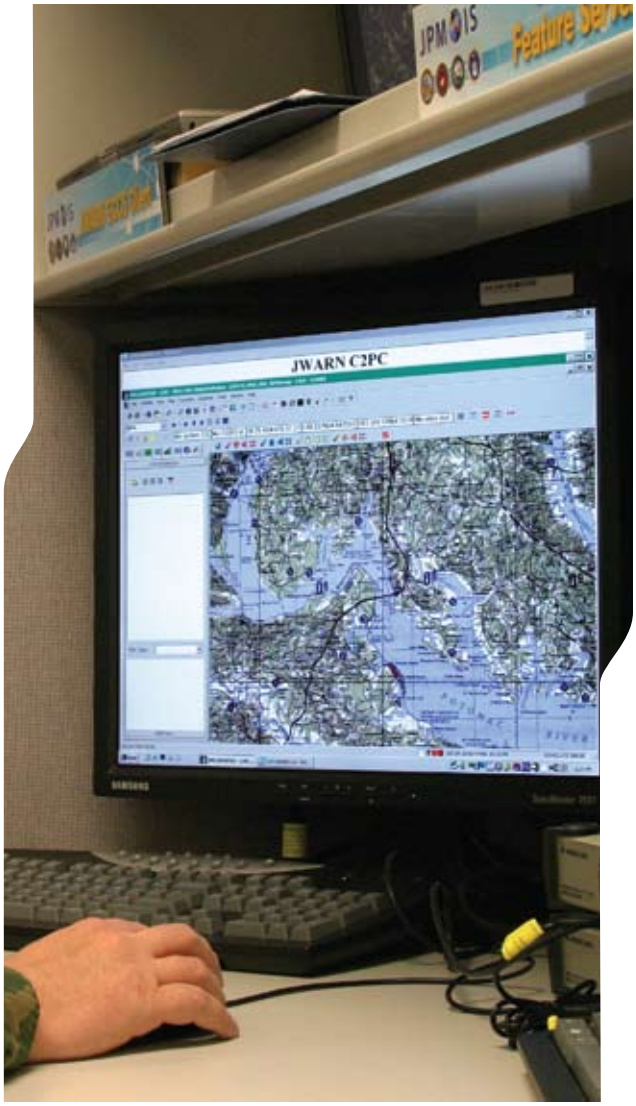
- Joint Warning and Reporting Network (JWARN): Currently in the production and deployment phase and commencing a robust phase of operational T&E to verify its operational effectiveness and suitability prior to a fielding decision
- JEM: Currently in two phases:
  - JEM standalone capability is in the FRP/deployment phase after completing a robust phase of operational T&E
  - An integrated C2 capability is currently in the production and deployment phase and commencing a robust phase of operational T&E to verify its operational effectiveness and suitability prior to a fielding decision
- JOEF: Currently in the System Development and Demonstration (SDD) phase as the program works to harmonize schedules with several critical Service models.

Against the backdrop of the functionality delivered by these three critical PORs, there are several integrating initiatives, all with the goal of increasing and simplifying the capability delivered to the Warfighter:

- Integrating with the several Joint and Service-specific enterprise and tactical C2 infrastructures and systems
- Synchronizing the re-engineering of these critical CBRN systems with the concurrent migration of the entire Department to a leap-ahead and modern service-oriented architecture, greatly amplifying the integrated capability
- Establishing standard logistics support (e.g., fielding, training, and a help desk to deal with hard-to-solve user problems) as well as integrating the three individual programs to provide a common look and feel, thus making the use and sustainment easier for the Warfighter.

Accomplishment

Several shape programs that fall under the JPM-IS and JPM-Guardian are nearing the end of their development life cycles. Four systems that have achieved life cycle decisions in the past year are the JEM Increment I, JWARN Increment II, Unified Command Suite (UCS), and Analytical Laboratory System (ALS) I. The JWARN Increment II moved into LRIP in July 2008 and the JEM standalone capability is scheduled to reach initial operational capability (IOC) in April 2009. The UCS, a vehicle-mounted integrated communication system, will reach IOC just before JEM in June 2010. Finally, ALS Increment I, which integrates several CB detection systems, went into FRP this year and will reach IOC by March 2009.



Shield

Shield capabilities provide protection to the force from CBRN hazards by preventing or reducing individual and collective (group) exposure. In the near-term, the JPM-IP and the JPM-ColPro have successfully worked to replace Joint and Service-unique items with modernized protective equipment that is providing increased protection time and decreased burden. Items and capabilities that are currently being fielded to the Warfighter include the following:

- Joint Service General Purpose Mask (JSGPM): Provides enhanced protection capabilities up to 24 hours, reduced breathing resistance, and will be the sole respiratory protection system for all Services
- Joint Service Lightweight Integrated Suit Technology (JSLIST) CB Coverall for Combat Vehicle Crewman (JC3): Provides combat vehicle crewmen-specific capability and design that was previously unavailable
- Joint Protective Aircrew Ensemble (JPACE): Provides enhanced performance to aircrews
- Alternative Footwear Solution (AFS): Improves Warfighters' ability to don and doff and decreases logistical burden with streamlined sizing and smaller packaging, making them easier to transport
- JSLIST Block II Glove Upgrade (JB2GU) Non-Flame Resistant (nFR) Variant: Provides improved comfort, tactility, and dexterity over legacy CBR protective gloves
- CB Protective Shelter: Provides forward-deployed medical teams with the capability to sustain medical treatment in a CBR-contaminated environment with personnel unencumbered by individual protective equipment (IPE) equipment
- Shipboard ColPro System Backfit: Provides ColPro equipment and systems on Navy amphibious ships, creating a contaminant-free area to protect personnel and equipment against CBR threats
- Chemically Protected Deployable Medical System (CP DEPMEDS): Provides ColPro to the core components of the Deployable Medical System combat support hospitals allowing medical operations in CBR threat environments
- Chemically Protected Expeditionary Medical System: Provides ColPro to the core components of the Air Force's Expeditionary Medical System hospital increments allowing medical operations in CBR threat environments.

Initiative

Providing chemical protection system operating room tents (Joint Expeditionary Collective Protection (JECP)) to the Navy Expeditionary commands.

The unpredictable nature of the evolving threat, coupled with the need to provide protection against a wider range of threats tailored to specific user communities that both optimize Warfighter performance and reduce logistical impacts, drives the future vision of the shield capability area. Technological advances provide an opportunity to revolutionize the DoD's future approach to individual and collective protective equipment. Current and future initiatives that are being investigated by both industry and government R&D efforts are focused on:

- Imbedded reactive materials that are ready for refinement and development into a Joint combat ensemble or FoS that optimizes and enhances protection while meeting the diverse needs of ground, mounted, air, and special operations forces
- Reticular chemistry that can be leveraged to design smaller and lower-profile filters for protective masks and ColPro systems that protect against the expanding spectrum of threats
- Early and up-front integration of CBRN capabilities into Warfighter protective equipment and fixed, mobile, shipboard, and transportable platforms.

Accomplishments

- **The JPM-IP and JPM-ColPro have several programs in development which improve upon existing Warfighter equipment and protection systems. One IP system, the JC3, completed milestone (MS) C FRP this past year. JC3 is a flame, petroleum, oil, and lubricant resistant semi-permeable suit that protects Warfighters against CB threats. Likewise, one ColPro system, the JECP shelter system completed MS B. The JECP is a FoS that will provide transportable and modular protection from CBRN agents to the Joint Expeditionary Force unencumbered by IPE.**
- **Installing ColPro systems (i.e., filtering air to the most critical interior spaces) remains one of the most effective ways of protecting ship personnel. This capability has been back-fit to 11 Navy amphibious ships through 2008. Another four ships will be completed in the 2009 to 2011 timeframe.**
- **The CBDP fielded the new CB protective flight suit known as the JPACE to the Navy. The suit is ready-for-issue upon deployment for all Naval aircrew.**
- **The Navy fielded the new CB Integrated Footwear System (IFS) for aviation and special warfare missions.**

Sustain

Sustain capabilities enable the quick restoration of combat power, maintain and recover essential functions that are free from the effects of CBRN hazards, and facilitate the return to pre-incident operational capability.

In FY 2008, the JPM-Decon established a new program, the Decontamination Family of Systems (DFoS), which addresses decontamination in a new way. Traditionally, decontamination has focused on the decontaminant and the applicators with one decontaminant for all situations. The DFoS will look at a range of decontamination equipment and procedures with the understanding that there is not a one-size-fits-all solution. The DFoS addresses decontaminants, applicator systems, agent identification, coatings and the decontamination process. DFoS efforts will transition into PORs, including MDAPs. To that end, a request for information was released to gather information on decontaminant technology advancements and possible solutions for the replacement of high test hypochlorite, super-topical bleach, and decontamination foam-200. In addition, the first quarterly decontamination triad meeting was held in Stafford, Va. on July 8, 2008. The decontamination triad is comprised of the JRO-CBRND, JSTO-CBD, and JPEO-CBD/JPM-Decon. The purpose of the triad is to create a forum to educate stakeholders, discuss major issues, and gain consensus for decisions.

Recently, the JPM-Decon began fielding the Joint Service Personnel/Skin Decontamination System (JSPDS) with Reactive Skin Decontamination Lotion (RSDL). RSDL, an FDA-cleared, individually-carried skin decontamination kit, was selected for the JSPDS Program. It provides the Warfighter with the ability to decontaminate the skin after exposure to CWAs/BWAs. RSDL supports immediate and thorough personnel decontamination operations—an improved capability over the existing M291 skin decontaminating kit. RSDL neutralizes, as opposed to removing, the agent. Additionally, it can be used to decontaminate individual equipment, weapons, and casualties (unbroken skin only). The JPM-Decon is conducting new equipment training with RSDL, both in the CONUS and OCONUS.

Another system, the JSTDS-SS, will perform operational decontamination and support thorough decontamination missions. It completed all testing in preparation for a FRP decision in the second quarter of FY 2009. The JSTDS-SS will be used to decontaminate tactical and non-tactical vehicles, crew-served weapons, aircraft and aircraft support equipment, building/facility exteriors, and terrains that have been exposed to contamination.

Initiatives

- The JPM-Decon initiated the small item decontamination test capability effort in coordination with the TEO; Dugway Proving Ground (DPG); Product Director for Test Equipment, Strategy, and Support; and JSTO-CBD. This effort will result in the development of a methodology for conducting the chemical decontaminant contact and vapor test on selected small items. Implementation for this test capability is expected by early FY 2009.
- The JSTDS-SS, used to decontaminate equipment to an operationally-acceptable level, is expected to reach FRP in June 2009. The development of the HRDS continues and will ultimately provide the capability to safely decontaminate and store contaminated human remains.

Medical

Medical acquisition PORs within the JPEO-CBD are executed by its subordinate organization, the JPM-CBMS. The JPM-CBMS has more than 1,000 person-years of advanced biopharmaceutical development and production experience in all functional areas to effectively and efficiently perform the mission. The JPM-CBMS uses government and commercial best practices to develop and acquire FDA-approved CBRN medical countermeasures and diagnostics. The JPM-CBMS innovative practices have maintained an 80 percent success rate for its medical programs on track for FDA approval, compared to an 80 percent failure rate with the commercial industry. Ongoing efforts include:

- Bioscavenger: Completed small-scale manufacturing, process development, and assay qualification. Completed pre-clinical safety studies as well as an IND application to the FDA.
- Improved Nerve Agent Treatment System: Completed good laboratory practice (GLP) pre-clinical safety studies. Continued the IND application process and initiated formulation, compatibility, and stability studies in the auto-injector form.
- Advanced Anticonvulsant System (AAS): Initiated Phase II clinical safety, formulation, and toxicology studies; process development; good manufacturing practices requirement development; and GLP animal efficacy studies. Initiated developmental testing of packaging.
- Skin Exposure Reduction Paste Against Chemical Warfare Agents and Soman Nerve Agent Pretreatment Pyridostigmine: Continued FDA-required post-marketing studies.
- Anthrax and Smallpox Vaccines: The DoD entered into interagency agreements with the DHHS to implement a single, integrated national stockpile for Anthrax and Smallpox vaccines, meeting the requirements for the Strategic National Stockpile (SNS) established in Homeland Security Presidential Directive-21, *Public Health and Medical Preparedness*, and the recommendations from the Government Accountability Office Report 08-88, A*ctions Needed to Avoid Repeating Past Problems with Procuring New Anthrax Vaccine and Managing the Stockpile of Licensed Vaccine*. The agreements will result in a cost avoidance of more than $10M dollars annually.
- Recombinant BoNT A/B vaccine: Continued Phase Ib clinical trial, manufacturing process validation, and non-clinical testing. Initiated Phase II clinical trial. Conducted MS B review and entered the SDD phase.
- Plague Vaccine: Completed Phase IIa clinical trial, large-scale manufacturing process validation and development, and non-clinical studies, including FDA-required passive transfer studies. Conducted DoD resource allocation decision to solely fund development of the U.S. Plague Vaccine candidate through FDA-licensure.
- Medical Radiation Countermeasures: Initiated non-clinical efficacy, safety, and toxicology studies for two candidates. Submitted two IND applications, both of which the FDA accepted, and one of which has an emergency use protocol.
- Dry Powder Inhaler-Atropine: Finalized atropine sulfate formulation and inhaler device design for Phase I clinical study. The IND application was submitted to the FDA on December 19, 2007.

In addition, the JPM-CBMS's Joint Vaccine Acquisition Program partnered with the DARPA to use the Rapid Vaccine Assessment Tool, known as MIMIC™, developed by VaxDesign. An attendant investment in support of dramatically improved animal models is the in-vitro (laboratory) screening, reformulation and down selection of vaccines that are heading toward clinical trials. MIMIC™'s current generation technology has already demonstrated human immune response against several military-relevant vaccines, was transitioned to CBMS for immediate implementation.

Accomplishments

- **The JPM-CBMS has accomplished the following FDA milestones for FY 2008: submitted four INDs to the FDA, completed three clinical trials, initiated four clinical trials, obtained FDA approval for two JBAIDS assays, and had 35 formal interactions with the FDA. The JPM-CBMS has delivered 440,000 doses of Smallpox vaccine and 1,300,000 doses of Anthrax vaccine to the SNS and fielded 31 JBAIDS.**
- **New Medical Countermeasures Office: In order to promote the DoD effort to ensure that only the safest and most effective medical countermeasures are available to Warfighters, the OASD(HA) established an Office of Medical Countermeasures within the Force Health Protection & Readiness Organization in the spring of 2008. This office is responsible for developing policies and strategic plans to support the acquisition of CB defense medical countermeasures that best meet the needs of the U.S. Armed Forces.**

Initiative

The sequential validation of efficacy in improved animal models followed by human specific safety and efficacy testing without putting patients at risk is a cornerstone of safe, effective and accelerated medical countermeasure development. Together, integration of the aforementioned platform technologies will have the greatest impact on rapidly bringing new vaccines to the Warfighter. This will assist in efficiently shaping future vaccine development efforts by reducing the number of laboratory animals for screening with significantly less cost and time.

The CRP continued development of immunoassays and polymerase chain-reaction genomic assays. It implemented a formal quality assurance/ quality control, systems engineering, validation, and developmental and operational testing program to encompass the transition and fielding of biological detection assays. The CRP also implemented standards in program office, testing laboratories, and biothreat agent production laboratories for compliance with the International Organization for Standardization.

Consequence Management

The JPEO-CBD and its JPM-Guardian are executing programs that provide a comprehensive, integrated, and layered CBRN protection and response capability for military installations and specialized military consequence management units both at home and abroad. Particular emphasis is placed on improving military-civilian interoperability in CBRN detection and response capabilities; providing tiered levels of CBRN protection and response capabilities to military installations; and tailored, modular and integrated COTS solutions to consequence management units.

Initiatives

- Collaborated with BioWatch to collocate DoD and DHS bio-detection technologies on DoD installations, enhancing assay equivalency work currently underway between the Centers for Disease Control and Prevention (CDC) and DoD laboratories. In jurisdictions where BioWatch and DoD installations are collocated, the IPP facilitated collaboration between local emergency managers and the military base through Memoranda of Agreement (MOA), asset visibility, and Joint exercises.
- Established an 80-member TIC/TIM Task Force from across the CBRN community and developed a repeatable prioritization process for use by industry in development roadmaps.
- The IPP partnered with the U.S. Army TACOM Life Cycle Management Command to execute integrated sustainment of CBRN IPP equipment at Army installations.
- Established a life cycle management process to support COTS modernization and technology refreshment across the CBDP.
- The IPP established the CBRN IPP Portal to provide CBRN awareness information to military members and their families and information on national initiatives to emergency managers on military installations worldwide.

Accomplishments

- Completed fielding a significantly upgraded communications package for the UCS to 55 Weapons of Mass Destruction Civil Support Teams (WMD-CST).
- Fielded enhanced CBRN detection and identification capabilities for the ALS to ten WMD-CSTs.
- Fielded tiered CBRN protection and response capability to an additional 27 CONUS and six OCONUS military installations through the IPP.
- The JPEO-CBD approved ALS to enter into FRP.

Major Defense Acquisition Programs Support

CBRN requirements have traditionally been viewed as a series of separate items resulting in individual CBRN equipment products rather than a system of systems (SoS) approach to CBRN defense that captures synergy and leverages multiple material solutions. The traditional approach provides a capability, but it also places a burden on the Warfighter and increases the requirements for dedicated platforms and operators. MDAPs, such as the Army's Future Combat Systems, do not allow for dedicated force structure to deal with CBRN defense. Therefore, the JPEO-CBD is developing leveraged and synergistic products that can be integrated into the fighting force. This allows commanders to focus on their primary mission unencumbered by CBRN hazards.

The status of CBRN products delivered may vary but is always aligned with the MDAP's schedules. Some MDAPs receive fielded CBRN products while others will be getting a mix of fielded products and those now in advanced development.

Software Support Activity

The JPEO-CBD has recognized the technical complexities associated with information technology (IT) aspects of the CBRN defense SoS approach. In direct and forceful response to these challenges, the JPEO-CBD established the SSA. The SSA is organized around the areas of architecture, data, information assurance, standards and policy, M&S, and S&T transition concentrating on:

- Providing a clear focal point for external policy, enterprise impact, and compliance
- Developing, coordinating, and implementing enterprise "desktop" procedures
- Establishing working groups to involve the CBRN community and related communities in enterprise decision-making
- Providing enterprise training and awareness
- Providing technical and expert guidance when requested.

Accomplishments

- **Integration of the 'separate' areas of CBRN defense capabilities–namely detection, protection, and decontamination–into an actual SoS. The SoS includes data fused from multiple CBRN and non-CBRN sensors. The sensors are modular, operate in a net-centric environment, include data fusing, decision support tools, and have reduced physical constraints. Analysis and decision tools that integrate CBRN and non-CBRN information enable rapid decision-making at the strategic, tactical, and unit levels to protect the Warfighter.**
- **The Common Chemical, Biological, Radiological, and Nuclear Sensor Interface (CCSI) standard provides common sensor interface performance requirements, required and recommended standards, recommendations for sensor architecture and implementation, and an evolving standard as technology changes to accommodate commercial CBRN sensor manufacturers. This effort is quickly integrating commercially-available technology into military sensor systems.**
- **Developed and implemented foundational policy and desktop procedures for structuring contracts and specifications to standardize the migration of all CBRN systems to a robust and integrated net-centric enterprise including metrics for monitoring compliance.**
- **Developed a CCSI standard to provide the foundation and framework for all CBRN sensors to communicate and interoperate.**
- **Made significant progress toward defining Common Components Management.**
- **Achieved significant strides in the development of integrated architecture products to better manage the complex JPEO-CBD SoS portfolio.**
- **Continued enhancement and implementation of the CBRN data model to facilitate the exchange of data and information both within the CBRN community and with adjacent communities.**
- **Developed and implemented step-by-step procedures to ease and achieve standardized compliance with several information assurance and Joint Staff interoperability certification mandates.**
- **Assumed a leadership role in the complex and costly area of CBRN M&S for the community, to include the development of a comprehensive Strategic M&S Plan.**
- **Provided hands-on guidance for the transition of the IT portion of all S&T to facilitate migrating critical technologies into PORs, ultimately into the hands of the operational forces.**

Logistics

Joint logistics with a focus on the materiel availability of CBRN equipment for the total Force is emerging through Joint sustainment strategies for new programs as well as life cycle management initiatives for legacy systems. The JPMs are Total Life Cycle System Managers for their products and are responsible for coordinating sustainment support strategies; integrating logistics, training, and industrial base readiness; and system improvement initiatives; with all CBDP stakeholders. The JPMs also provide data to the Services for budgeting purposes. Improving organizational relationships and coordination within the CBDP is a key step to improving logistical readiness and materiel availability.

The JPEO-CBD continues implementing business process initiatives to improve the logistical readiness of the DoD's CBRN defense equipment. This section describes a few of these initiatives.

Accomplishments

- Joint Materiel Release (JMR): The JMR Program was developed to ensure that all CBDP systems are safe, suitable, effective, and supportable. In its first year of implementation, the JMR has proven its effectiveness and value.
  - As of August 2008, 28 PORs have participated in, and benefited from, a Joint Independent Logistics Assessment (JILA).
  - Involvement of JILA teams early in the SDD phase is providing a team effort in supportability planning that will result in more available and reliable systems for our Warfighters.
- Joint Equipment Assessment Program (JEAP) Surveillance and Shelf Life: Since the beginning of FY 2008, the JEAP has tested more than 100 JSLIST lots and five chemical protective glove lots resulting in a cost avoidance of more than $8.1M. Shelf life extension testing for medical materiel is carried out by the FDA.
- In a program similar to the Readiness Improvement Program (RIP) for ships, the Navy Facilities Command in coordination with the Naval Sea Systems Command (NAVSEA), initiated an improved storage and distribution of CBRN defense equipment for commands ashore. The Life Cycle Management Improvement Program (LCMIP) ensures optimal readiness levels are achieved through the adequate maintenance, storage, and issuance of CBR IPE and masks. In addition, LCMIP reduced installation manpower requirements for equipment shelf life/serviceability maintenance, replenishment, and inventory.
- The NAVSEA expanded two complementary programs to significantly improve Fleet CBRN-defense readiness: The RIP which centrally stores, manages, and issues consumables releasing only what is needed to support the ship deployment cycle and the readiness assistance visit (RAV) to conduct ship training and verify equipment readiness just prior to operational deployment.
- As an adjunct to the RIP effort, the NAVSEA established a Waterfront CBRN Support Team in Norfolk and San Diego to assist ships preparing to deploy overseas. Consisting of technical experts and SMEs, the teams are able to evaluate the status of the ship's CBRN equipment, assist in repairs and maintenance and provide hands-on, individual training to Sailors. A total of 83 activities were processed into the RIP.
- To ensure that deploying Marines possess serviceable CBRN defense equipment, the Marine Corps has initiated the U.S. Marine Corps Strategic Logistics Asset Management (SLAM) Project. Through its consolidated storage facility network, the SLAM Project promotes equipment/supply readiness through the proper maintenance, storage, and issuance of unit and individual equipment for the Marine Corps' operating forces. It also ensures timely, accurate, and complete supply accountability information that includes item shelf life and lot number management.
- In order to centrally manage and outfit all CONUS and selected OCONUS Army Warfighters with their CBRN Soldier's individual basic load, the Army has developed the Individual Chemical Equipment Management Program (ICEMP). Forward positioned IPE inventories (footprints) are maintained at garrisons in support of Warfighter deployments. These inventories are based on deployment history timelines and requirements identified by their major subordinate commands and validated by the Army Reserve Commands. The ICEMP team provides IPE management guidance, ensuring depots and garrisons are stocking and issuing serviceable IPE to deploying Warfighters.

Total Asset Visibility

The JACKS-RW continues to grow as the all-Service single point of entry for access to CBRN defense system information. While there are some additional steps required to achieve complete automation of asset visibility, this year marks a significant effort by all Services and the Defense Logistics Agency (DLA) towards the goal of achieving CBRN equipment total asset visibility (TAV) for the CBDP. Last year's ARC marked the first year the CBDP reported exclusively using this automated capability and focused on the on-hand inventories of 11 go-to-war items. The data listed below represents the total number of systems currently being reported on in JACKS-RW by the Services and DLA and is available for review at the link below. This report represents a significant step toward automation of reporting TAV items, and now includes all available automated CBDP inventories of consumable and non-consumable products. The CBDP continues to monitor progress, with the goal of achieving full operational capability in JACKS-RW (i.e., each Service reporting 100 percent of the CBRN items for which they have requirements/ inventories) in FY 2009.

Number of CBRN Related Items Reported on in JACKS-RW

Army	98
Air Force	91
Marine Corps	67
Navy	25

Innovation

Unit identification (UID)/radio frequency identification is a critical component of the CBDP's TAV strategy. In the past year, significant progress has been made in the implementation of UID in legacy and new procurements.

Additional equipment information including condition, shelf life, and detailed quantities within each of the categories in the roll up above can be viewed by accessing the JACKS at: https://jacks.jpeocbd.osd.mil/secure/default.aspx. Non-users must request access to this website, as this information is For Official Use Only. Approval is normally granted within 24 hours.

Initiatives

- **The Joint Medical Asset Repository (JMAR) is the single authoritative repository for the Services and the DLA medical materiel asset visibility. The JMAR provides quarterly updates to the JACKS. To access the JMAR directly, visit https://jmar.detrick.army.mil/**
- **The OASD(HA), ODATSD(CBD&CDP), and Services have partnered to develop a CBRN dashboard to monitor CBRN inventories at all DoD medical facilities and medical distribution centers. The CBRN dashboard is scheduled to become operational on April 30, 2009.**

  The dashboard will be developed at the Joint Medical Logistics Functional Development Center as part of the JMAR under the Defense Health Services Systems Program Office. The JMAR is a web-based application that provides access to integrated Joint Service medical asset information. The DoD recognizes the JMAR as the single, integrated authoritative source for Joint medical logistics information provided to the Joint TAV system. The JMAR is designed to warehouse data and provide real-time visual reports (similar to the indicators on the dashboard of a car) on the status of medical materiel (vaccines, medicines, and equipment) held in inventory.

  The CBRN dashboard will be modeled after the Military Health System's (MHS) Pandemic Influenza dashboard, also in the JMAR. The CBRN dashboard will promote CBRN readiness by indicating the availability and serviceability, or shelf life, status of medicines and vaccines graphically. This dashboard could indicate whether there is enough stock of a certain drug on hand at a given installation to meet readiness parameters, or that CBRN readiness materiel will expire soon. Also, the JMAR will help improve asset utilization, as supplies with a shorter shelf life in an inventory can be rotated to ensure maximum use and save inventory investment dollars.

Chemical and Biological Defense Program Product List

A very important measure of the CBDP and the JPEO-CBD is the number of new capabilities developed and fielded. The CBDP fielded more than 1,000,000 items in FY 2008. The table below depicts FY 2008 fielding quantities and recipient Services from October 1, 2007 through September 30, 2008.

Accomplishments

- In FY 2008, the CBDP conducted the first program fielding of the JSGPM M50 to the NAVSEA Assault Craft Units operating Air Cushioned Landing Craft. The JSGPM replaces the MCU-2/P mask, which improves amphibious assault missions in CBRN environments.
- The NAVSEA employed a new fielding concept to align the Navy shipbuilding and conversion process for the management of CBR defense consumables for new construction surface ships. The concept, just-in-time fielding, will allow shipyards to purchase perishable stocks just prior to initial operational deployment.

FY 2008 Fielding Quantities

JPM	System	Services Fielded				Totals
		Army	Air Force	Navy	Marine Corps	
JPM-Decon	JSPDS RSDL (boxes, 60 packets per box)	287,815	--	--	--	**287,815**
	JSPDS Inactive Skin Decon Lotion (boxes, 60 packets per box)	272,560	--	--	--	**272,560**
JPM-NBC CA	ACADA	924	--	--	--	**924**
	ICAM	1,204	--	--	--	**1,204**
	JCAD	49	--	--	--	**49**
	AN/PDR-75	549	--	--	--	**549**
	AN/PDR-77	68	--	--	--	**68**
	AN/VDR-2	2,260	--	--	--	**2,260**
	AN/UDR-13	2,142	--	--	--	**2,142**
JPM-BD	JBPDS Biological Integrated Detection System, M31E2	77	--	--	--	**77**
	JBPDS XM98	--	--	21	--	**21**
JPM-ColPr0	CPDEPMEDS Training Set	1	--	--	--	**1**
JPM-CBMS	JBAIDS	51	--	--	--	**51**
JPM-Guardian	IPP	13	7	10	3	**33**
	UCS Increment I	38	--	--	--	**38**
	ALS Increment I	10	--	--	--	**10**
JPM-IP	Joint Service Mask Leak Tester	39	312	33	--	**384**
	JB2GU nFR	53,565	137,862	80,060	11,321	**282,808**
	AFS	53,098	49,990	31,425	16,079	**150,592**
	IFS	--	--	14,894	--	**14,894**
	JSGPM	--	10,282	2,000	--	**12,282**
JPM-IS	JWARN Block 1F	9	24	3	7	**43**
	JEM Increment I (NET)	50	55	--	--	**105**
Totals		**674,522**	**198,532**	**128,446**	**27,410**	**1,028,910**

Note: Table does not reflect systems fielded to the Services prior to FY 2008.

Industrial Base

The CBDP continues to strive to increase the visibility of the CBRN industrial base status, and the risk associated with the industrial base with regard to a CBRN attack on the homeland. The industrial base continues to be challenged by fluctuations in demand between times of war and times of peace. The changes that occur in demand result in fluctuation in production. CBRN defense items for which peacetime demand is often inadequate to maintain the industrial base include chemical protective suits and gloves, and nerve agent antidote auto-injectors.

The JSLIST industrial base is of significant concern at present and warrants a categorization of "high" risk. The ramp-up of JSLIST production for Operation IRAQI FREEDOM (OIF) and Operation ENDURING FREEDOM (OEF) led to the accelerated fielding of the Total Service Requirement leading to the cessation of JSLIST program funding in FY 2007. Since then, the demand for the JSLIST decreased to a point of creating an unstable industrial base. To understand this issue and develop mitigation strategies, the JPM-IP developed an industrial base supply chain model that enables proactive management of the JSLIST (garment only) industrial base.

- The model is designed to assist the JPM-IP in developing or validating industrial base management strategies that ensure the availability of a viable, responsive industrial base in support of operational and readiness requirements throughout the JSLIST life cycle.
- Specific factors considered by the model include right-sizing inventory and the number of active and inactive producers, surge planning, identification of funding requirements, validation of funding strategies, identification of operational and funding risks, and mitigation options.
- The JPM-IP is currently using the model to assist the DLA in determining "War stopper" funding requirements to sustain the JSLIST industrial base until the next generation suit is developed and available to the Warfighter. Additionally, other JPM-IP systems are under consideration for modeling, including the JSAM, JSGPM, JC3, and JPACE.

Initiative

The JPM-CBMS, in coordination with the DHHS, has been directed to conduct an analysis of alternative production capabilities for medical CBRN countermeasures. The analysis will provide recommendations for the most efficient alternative for medical CBRN countermeasures production. The analysis is scheduled to be completed by May 2009.

Assessment

Within the DoD acquisition system, the JPEO-CBD is the designated MDA for all CB defense acquisition PORs. For FY 2008, there are 51 PORs with 18 active Acquisition Program Baselines (APB). The APBs are used to manage the cost, schedule, and performance throughout the SDD phase of the acquisition process, to the FRP decision review.

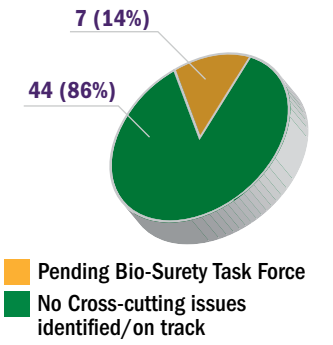
This section will assess cost, schedule, and performance based on the following definitions:

- **Green:** No cross-cutting issues, i.e., cost, schedule, or performance issues that cut across PORs
- **Yellow:** Cross-cutting issues with identified resolution within established processes
- **Red:** Critical issues that require FO/GO resolution.

Overall Acquisition Program Assessment–Green: No Cross-Cutting Issues/On Track
Overall success of acquisition programs is measured by outcomes in terms of fielding additional or new capabilities to the Warfighter.

During FY 2008, JPEO-CBD monthly acquisition status reports reflected the Defense Acquisition Executive summary format for all programs. Relevant information is reviewed monthly for all 51 programs under JPEO-CBD purview, to include those in FRP and pre-system acquisition where APBs are not pertinent. During FY 2008, 12 APBs were changed. Nine were updated as required during decision reviews, two were updated to reflect requirements changes, and one reflected a restructure of an aviation respiratory protection program to accommodate three distinctive platforms requirements.

Overall Acquisition Program Assessment



** Seven programs in the medical portfolio may be affected by implementation recommendations of the U.S. Army Bio-surety Task Force. The impact is not known at this time.*

Beginning in FY 2008, the JPEO-CBD became the Materiel Release Authority for all CB defense acquisition PORs. This marks the first year of the implementation of the JMR process. The JMR consolidated and integrated the four separate Service processes into a single Joint process to eliminate redundancy and streamline acquisition efforts while ensuring the Joint Forces continue to receive safe, effective, suitable and supportable systems. With its emphasis on "up front and early" logistics involvement, the JMR process reduces the acquisition process by 90 to 120 days and ensures all full materiel release requirements are met at the FRP decision review. The JMR is another business process improvement driven by a vision to bring collaborative approaches and solve complex issues.

During FY 2008, the JPEO-CBD fielded 25 different systems to the Army, Navy, Marine Corps, and Air Force. These total package fieldings included 144 training events totaling 2,469 students and approximately 1,000,000 individual pieces of equipment fielded globally. The FY 2008 Fielding Quantities table on page 39 provides further detail as to which systems were fielded to which Service. Overall satisfaction of these training and fielding events was 4.7 with 5.0 being the best on a scale of one to five.

Cost: Green: No Cross-Cutting Issues Identified/On Track
The "cost" rating has been upgraded from yellow to green in FY 2008. The cost growth issues related to the medical portfolio affected by new FDA requirements for earlier full-scale production processes prove out were addressed in the FY 2010 to 2015 POM. The U.S. Army Bio-surety Task Force is currently reviewing bio-surety, bio-safety, and personnel reliability programs. The outcome of this task force's work on the CBDP is not known at this time.

Schedule: Green: No Cross-Cutting Issues Identified/On Track
Systems are being procured and fielded on-time. No cross-cutting issues exist within the 18 PORs with APBs. Schedules have been updated in MDA-approved APB revisions during decision reviews to reflect technology challenges, contractor progress during development and demonstration, and the one APB program restructure. The JOEF is currently being restructured due to some external factors. It is designed to be a "federation" of models; however, the mobility and medical models that are a critical foundation for the JOEF will not be available to support the JOEF acquisition schedule. During FY 2009, the JOEF Program, in collaboration with the Services and the Joint Staff, will be considering several options for restructuring this essential CBRN information system.

Performance: Green: No Cross-Cutting Issues Identified/On Track
The CBDP continues to field militarily-significant increments of capability, with no performance issues that cut across the acquisition PORs. Individual acquisition program-specific performance challenges have been addressed within the CBDP and reflected in APB updates during decision reviews.

Summary

The CBDP continues to advance development of capabilities in the areas of sense, shape, shield, and sustain. Sense programs under the JPM-NBC CA have met KPPs and the JCAD Increment I, JCBRAWM, and JBPDS have moved into either the LRIP or FRP in FY 2008. Two shape systems (i.e., JWARN and JEM) have achieved life cycle decisions in FY 2008. Several shield programs under the JPM-IP and JPM-ColPro improve existing Warfighter equipment and protection systems and are currently in development, while the JC3 passed MS C and JECP passed MS B this past year. Three decontamination systems within the sustain area (i.e. JSTDS-SS, JSTDS-Large Scale, and HRDS) also achieved MS progress in the last year.

The CBDP will continue efforts to integrate separate areas of CBRN defense capability toward a SoS which protects the Warfighter by enabling rapid decision-making at the strategic, tactical, and unit levels. The SoS will include data fused from several CBRN and non-CBRN sensors, which can operate in a net-centric environment, fuse data, provide decision-support tools, and reduce physical constraints.

A major milestone for the CBDP is the evolution of the JACKS-RW and its role in achieving TAV. The CBDP is working towards the complete automation of this reporting system and has cross-referenced inventory and shelf life data across the Enterprise.

Investments in acquisitions and logistics information infrastructure help to ensure a structured, executable, and integrated medical and non-medical Joint CBDP that balances urgent near-term procurement needs to equip the Warfighter and secure the homeland from a terrorist attack and far-term S&T efforts to mitigate future CBRN threats. The acquisition and logistics arena of the CBDP have helped to establish the foundation required to meet the *NMSCWMD* passive defense, force protection, homeland defense, and consequence management CBRN defense requirements.

Test and Evaluation

The development and fielding of CBRN defense equipment requires highly-specialized and robust T&E infrastructure including facilities, methodologies, and personnel resources. This section describes the accomplishments in CBDP T&E infrastructure improvement for FY 2008 and discusses the purpose and scope of the CBDP T&E infrastructure investments.

The dynamic nature of expanding CBRN threats challenges the capability of U.S. T&E infrastructure, which must continually adapt to test and evaluate advanced technology systems against evolving threats in operationally-realistic environments. Surety testing of CBDP systems requires generation and control of BWAs/CWAs in facilities designed to contain these agents without personnel or environmental hazards. These facilities must meet regulatory and legal requirements in order to handle BWA/CWAs. Outdoor testing is based on the use of simulants, which are first shown to be safe and correlated with the BWA/CWAs. Both types of tests require specialized personnel, facilities, instrumentation, and methodologies which are developed specifically for each type of test/system and threat tested. Targeted investment initiated in FY 2006 is starting to bear fruit, with improved T&E capabilities delivered, or in progress this year.

> The FDA is the T&E authority for the safety and efficacy of all medical CBDP products. FDA approval of drugs, licensure of vaccines and biologics, and clearance of medical devices is required before any drug, vaccine, biologic, or device can be used by or on a Warfighter.

The primary capability for non-medical CBDP testing is located at DPG. The CBDP operates and sustains DPG as part of the nation's Major Range and Test Facility Base to provide the specialized T&E facilities required for surety and simulant testing. DPG provides acquisition system developmental testing and supports operational testing by all Services. The CBDP has met the requirements of the *FY 2003 National Defense Authorization Act* to fully sustain DPG's O&S, moving from 33 percent funded to 100 percent funded. This allows acquisition programs to have an established test bed and to plan their test programs to fund only direct test costs.

The CBDP TEO published the FY 2010 to 2015 *Test and Evaluation Infrastructure Investment Strategy (TIIS)* in FY 2008 as the path forward for defining and fulfilling future T&E infrastructure needs. This strategy describes the investments necessary to support the CBDP from FY 2010 to 2015 and encompasses Program-wide goals, S&T, and linkages to acquisition PORs. It provides the current status and accomplishments of the infrastructure investment program, as well as the planned investments during FY 2010 to 2015 and reflects the inputs of the entire CBDP community. Efforts to realize improvements in CB defense T&E infrastructure were initiated in FY 2006, are ongoing through the FY 2010 to 2015 POM, and are aligned with the S&T development and acquisition programs they support. This series of incremental improvements is driven by the need for continuing improvement of threat realism, refined test conditions and challenge materials, test robustness, M&S, and the ability to address continually-evolving threats.

Innovation

Test Grid: **This project will fully instrument DPG's target R, target S, and tower grid for CB simulant field testing to include modern, accurate, and reliable referee instrumentation; near-real-time data analysis and visualization tools; a data management system; a command control communications computers intelligence surveillance and reconnaissance (C4ISR) network; and a safari (mobile) capability. This capability will provide testers with the ability to accurately track simulant cloud movement.**

T&E capability and methodology development projects are planned and executed in multi-year increments, and successful implementation is directly dependent upon the funding levels in each year. New T&E infrastructure capabilities for FY 2010 to 2015 have been identified. Continued investment in T&E infrastructure is driven by advanced technologies and emerging threats that require additional test capabilities and revalidation for refined test conditions.

The *TIIS* focuses on acquiring T&E infrastructure capabilities to remedy remaining T&E capabilities gaps and further improve operational realism of testing for a greater range of BWA/CWAs. Simulant development, a key area of the S&T effort, includes developing families of simulants that can be used to predict system agent performance and that operators can use safely in outdoor environments. Mobile, deployable test capabilities are also needed to perform field simulant testing in multiple natural environments to ensure that CBRN defense systems are effective, suitable, and survivable across the range of environments. These capabilities will enable testers to provide combat developers with specific information regarding how to properly use CBRN defense systems to mitigate risks in the CBRN environment and provide system developers with the information required to adequately develop and mature the systems.

Accomplishments

- Completed the chemical lab renovation at DPG, adding multiple lab facilities for testing using CWAs, with two new chambers (7,900 ft^2 and 3,750 ft^2 of lab area).
- Completed a critical design review (CDR) of the NTA chamber building at ECBC in March and a CDR of the NTA chambers in April. Initial capability is scheduled for FY 2013.
- Delivered two Spectroradiometers, instruments that report size, location, concentration, and homogeneity of a chemical vapor cloud as a function of time.
- Completed Joint Ambient Breeze Tunnel (JABT) upgrades.

Initiatives

Capability improvements expected to be delivered in FY 2009:

- *Active Stand-Off Chamber (ASC) upgrades:* An outdoor chamber used to test simulants only for active infrared sensors.
- *Dynamic Test Chamber (DTC):* Provides capability and control of real-world chemical point detection testing in various environments and challenge concentrations – capability available in the fourth quarter.
- *Backgrounds and Interferents Data Library:* Initial capability in the fourth quarter.
- *ColPro Facility Upgrades:*
  - Simulant Test Platform – available in the third quarter
  - Dynamic exit/entry test module – available in the second quarter
  - Mechanical Filtration – available in the second quarter
  - Advanced Air Purification – available in the third quarter.
- *Decon Facility Upgrades:* Available in the second quarter.
- *Aerosol System Test:* Detects and quantifies fluorescently-tagged aerosols on the skin surface.
- *Man-in Simulant Test (MIST) Chamber Upgrades, Real-time Sensor:* Monitors the breakthrough of a simulant through IPE material in real-time—available in the fourth quarter. It should be noted that the DPG MIST facility is currently non-functional and requires rebuild due to an accidental electrical fire in the control room. No personnel were injured.
- *IPE Grid:* Provides a commonality of measurements in IPE system-level testing to support the evaluation of IPE.
- *Bio Spectral Instrument:* Provides the ability to measure BWAs and simulants in support of biological detection systems testing.
- *ColPro Facility Upgrades:* The chemical agent simulant and toxic vapor filtration test upgrade existing small air purification test fixture to improve reliability, performance, and monitoring. The long-Term CBR Filtration Evaluation Facility is capable of evaluating the efficacy of filtration technologies over extended periods of operation.

Chemical and Biological Materials Effects Database

Public Law 108-375, the *Ronald W. Reagan National Defense Authorization Act* for FY 2005 called for a centralized database that contains comprehensive information on the effects of CB agents and decontaminants on materials used in defense-critical systems and is easily accessible to personnel who have duties to ensure the survivability of defense-critical systems upon contamination of such systems by CB agents.

The CBR Survivability Working Group, U.S. Army Research Laboratory Survivability/Lethality Analysis Directorate, and CBRN Defense Information Analysis Center team developed a new Web-enabled CB contamination survivability database called the Chemical and Biological Material Effects (CBME) Database. The CBME Database is a user-friendly system that is easily accessible to personnel with the mission of ensuring the CB agent contamination survivability of defense-critical systems. The CBME Database is an online tool that includes data from test reports on over 500 materials that have been exposed to CWAs, BWAs, simulants and/or decontaminants and tested for material effects. To request access to the CBME Database visit: https://cbme.cbrniac.apgea.army.mil/Login.aspx.

Assessment

The CBDP T&E infrastructure is improving as a result of investments in FY 2006 to 2008. T&E efforts are assessed as green because no cross-cutting issues have been identified and efforts to address T&E infrastructure limitations are ongoing. Funding for T&E infrastructure improvement is executed by the JPM-NBC CA.

Sense–Chemical Detection System T&E Infrastructure
Current capabilities for chemical stand-off detector testing are limited to a stand-off CWA chamber (simulant only) and field simulant capability for CWA stand-off detection performance tests. Current CWA point detection performance test chambers (agent) can provide common static challenge concentration profiles with a small range of environmental conditions and interferents. Efforts to improve this area include a NTA test facility, a DTC, and equipping of the renovated Chemical Surety Laboratory. The NTA facility provides a capability to conduct emerging, highly-toxic threat materials testing. The DTC provides a new capability for testing chemical point detection systems against chemical agents in various environmental conditions and with dynamic and high sensitivity challenge conditions.

Sense–Biological Detection System T&E Infrastructure
Current capabilities for biological detector testing comprise subsystem level tests of point detection systems at bio-safety level three for BWAs, as well as system chamber and field tests for simulants. Efforts to improve the biological detection testing infrastructure include a whole system live agent test (WSLAT) chamber and biological stand-off detection T&E capabilities. The WSLAT chamber will support the testing of all biological point detection systems in production configuration in BWA environments.

Innovation

WSLAT: **This capability will allow production configuration and full system biological point detectors to be performance-tested directly with BWA challenges, and support the evaluation of stand-off detection systems. At present, only sub-systems are directly tested with BWAs.**

Sense–Field Simulant T&E Infrastructure
Current capabilities for field simulant testing comprise traditional referee instrumentation and simulant challenge dissemination devices. Efforts to improve in this area include a fully-instrumented 1km x 1km resolution fixed test grid and three 5km x 5km medium resolution re-locatable test grids that integrate cloud tracking equipment, meteorological equipment, test data network, C4ISR network, and an operations center. This T&E capability will accommodate CB vapor and aerosol simulants. Additional efforts include instrumentation and characterization of the existing JABT and ASC facilities. The JABT/ASC effort will provide facilities for controlled CB simulant cloud and stand-off detector testing.

Shield/Sustain–IP, ColPro, and Decontamination T&E Infrastructure
Current test capabilities comprise chemical agent material swatch tests, which allow for comparative performance assessment under limited conditions and test environments, a vapor and aerosol MIST, an IPE Grid, a simulant agent resistant test mannequin, a torso to test CB masks, and protection factor mask tests. At present, the MIST capability is out of commission due to a fire in the control center.

Efforts to improve in this area will include a decontamination chamber, an IPE Mannequin System, MIST instrumentation, CB agent resistance test (CBART) equipment, and ColPro instrumentation/chamber. The decontamination chamber will provide an enhanced ability to conduct decontamination and residual agent off-gas testing. The IPE Mannequin System will provide an articulated robotic mannequin that simulates Warfighter activities for evaluating IPE performance against CWA challenges. The MIST instrumentation will provide a near-real-time simulant sensor system to monitor penetration of simulant vapor and aerosols during testing. The IPE Grid will provide test procedures to establish commonality measurements for IPE system-level performance tests. The CBART will provide improved test fixtures and a near-real-time testing capability under a range of environmental conditions for IP and ColPro materials. ColPro instrumentation upgrades will provide improved test capabilities for the evaluation of entire ColPro systems, subsystems, and individual components.

Innovation

CBART: **This capability will provide the ability to characterize protection performance of IP and ColPro materials relative to toxic hazards for use in M&S hazard prediction. It will also provide improved experimental control and more realistic test environments for a broader range of advanced technology IP and ColPro materials.**

Shape–M&S T&E Infrastructure
Current M&S test capabilities do not exist for many acquisition programs. Efforts to improve this area include the development of a synthetic test environment library of real-world environmental and interferent physical characteristics that impact CB system performance. The environmental signatures will be integrated into models to generate synthetic environments to allow material performance assessment under various conditions. A key focus of S&T T&E supporting efforts is to develop models to predict system performance using material and component T&E data for each commodity area.

In summary, T&E infrastructure is improving with key CB defense T&E capabilities delivered in FY 2008 and those coming online in FY 2009. The CBDP TEO published the *TIIS*, which provides the basis for a fully-integrated and coordinated T&E input for the FY 2010 to FY 2015 POM. This effort will ensure that the CBDP keeps its T&E infrastructure up-to-date and aligned with national priorities to support POR testing needs.

Doctrine, Training, Education, and Exercises

CBRN defense doctrine, training, education, and exercises are key components of a fully integrated Joint CBRN defense capability. These components prepare U.S. Armed Forces to carry out their missions on the battlefield and in defense of the homeland in the face of CBRN threats with interagency, non-governmental organizations, and multi-national partners.

The DoD is currently developing a DoD CBRN Defense DTL&E Strategic Plan. The goal is to continuously transform Joint CBRN defense capabilities through the reinforcement of DTL&E. This will enable the DoD to readily operate with interagency, non-governmental, and multi-national partners in support of the National Military Strategies. The plan will achieve its goal through continuous facilitation, coordination, and synchronization of existing oversight processes in order to assess feedback, monitor results, and identify areas that require additional emphasis.

The Services are responsible for providing CBRN Defense education and training to their members according to Title 10. The CBDP builds effective multi-Service and Joint CBRN defense capabilities by incorporating Service CBRN defense capabilities into Joint doctrine, training, education, and exercises.

Doctrine

There are four forms of DoD doctrine—multi-national, Joint, multi-Service, and Service—which range from the strategic to the operational and tactical levels of war. Additionally, the United States participates in various multi-national doctrine efforts with its allied partners, such as the North Atlantic Treaty Organization (NATO).

The Joint Staff directs the evolution of doctrine through the examination and incorporation of best practices and lessons learned from current operations, validated CBAs, and approved CONOPS. Applicable CBRN defense Standards of Proficiency are codified within Service, Multi-Service, Joint, and Allied doctrine and TTP publications. The Joint Staff continues to conduct CBAs to identify CBRN defense gaps and shortfalls and their solutions.

Accomplishment

During FY 2008, the DoD signed or revised a total of 26 publications. The DoD signed or published one Joint publication (JP), two multi-Service and three Service manuals, and two NATO documents. In addition, two JPs, 14 multi-Service and Service manuals and two NATO documents are under revision.

Joint Doctrine

Title 10 U.S.C. and JP 3-11, *Joint Doctrine for Operations in NBC Environments*, state that individual training and exercises to test CBRN defense proficiency remain under the purview of the Services. The purpose of Joint doctrine is to enhance the operational effectiveness of U.S. Armed Forces. Joint doctrine includes strategic direction, employment, and integration support by others, such as combat support agencies; force preparation for employment by Joint Force commanders; and training and education for those conducting Joint operations. Joint doctrine serves to make U.S. policy and strategy effective in the application of U.S. military power.

Multi-Service Doctrine

Multi-Service doctrine provides fundamental principles which guide two or more Services to conduct military operations in a concerted manner. In FY 2008, the Services jointly completed updates to existing multi-Service doctrine and TTPs for installation CBRN defense and CBRN consequence management, while initiating/continuing the revision/development of doctrine associated with CBRN operations in support of CWMD, WMD elimination, C2, CBRN reconnaissance and surveillance, and implementation of international standardization agreements. The Army performed lead Service responsibilities for the publication of multi-Service TTPs for installation CBRN defense and multi-Service doctrine for CBRN consequence management operations. A complete listing of relevant allied, Joint, and multi-Service CBRN defense doctrine is available on the ODATSD(CBD&CDP) website: http://www.acq.osd.mil/cp/.

Army Doctrine

The MANSCEN and U.S. Army CBRN School (USACBRNS), in conjunction with the Department of the Army, perform lead Service functions for the development of tactical multi-Service doctrine and associated TTPs. During FY 2008, the Army also developed and implemented Field Manual Interim 3-90.10, *Chemical, Biological, Radiological, Nuclear, and (High Yield) Explosives (CBRNE) Operational Headquarters (20th Support Command (CBRNE))*, and Field Manual 3-11.22, *WMD-CST Operations*. These two publications provide the Army's doctrinal role and capabilities employment for WMD elimination operations as required by the 2006 *QDR*, and Title 32 response capabilities for the DoD WMD-CST mission.

Navy Doctrine

The Navy views CBRN threats as a component of the operational environment, not as a unique mission. During 2008, the Navy and Marine Corps expanded the Navy Aviation Training Operations and Procedures Standardization manual to include radiological and nuclear defense-related procedures. The Navy completed work on special TTP-level CBRN defense guides for its special warfare and amphibious operations communities. Work continues on updating the primary shipboard reference for nuclear and radiological defensive measures, *Naval Ships' Technical Manual 070*. The Navy also continues to develop TTPs and acquisition requirements for conducting at-sea maritime interception operations for situations when the threat or the presence of CBRN weapons or components exists. As these experimental TTPs are approved, incorporation will take place into appropriate doctrine, such as Navy TTP 3-07.11, *Maritime Interception Operations*.

Accomplishments

- **The Chief of Naval Operations promulgated OP NAV Instruction 3400.11, *Navy Policy and Alignment for CWMD*. It delineates Navy organizational roles and responsibilities to implement DoD CWMD strategy and policy.**
- **The Commander, Naval Air Systems Command issued Instruction 3400.10, *CBR Defense Training and Readiness (T&R)*.**
- **The Joint Staff developed a CWMD elective and conducted it at the Marine Corps Command and Staff College in Quantico, VA and the Joint and Combined Warfighting School (JCWS) at Joint Forces Staff College. The JCWS is conducted four times annually.**

Marine Corps Doctrine

During FY 2008, the Marine Corps published two publications: Marine Corps Warfighting Publication (MCWP) 3-37.2C, *Multi-Service Tactics Techniques and Procedures (MTTP) for CB Operations*, and MCWP 3-37.5, *MTTP for Installation CBRN Defense*.

Initiative

Emerging WMD threats, including TIMs and RDDs have required the Marine Corps to adopt new TTPs to mitigate these hazards through creation of the Marine Air Ground Task Force (MAGTF) CBRN Consequence Management set. The Marine Corps is currently finalizing the incorporation of these sets into the operating forces as well as incorporation of these new TTPs into the formal Period of Instruction at the CBRN Defense School. The sets and subsequent capability will provide the MAGTF Commander with the ability to conduct sensitive site exploitation in CBRN environments, specifically TIM environments, outside the scope of conventional warfare agents.

Air Force Doctrine

Air Force Doctrine Document 2-1.8, *Counter-Chemical, Biological, Radiological and Nuclear (C-CBRN) Operations*, is the substantive doctrinal publication for Air Force operations in CBRN environments. In concert with the AFMAN 10-2502 series and AFMAN 10-2605, *Education, Training and Exercise (ETE) Competencies for C-CBRN Operations*, these newly developed documents address execution of the Air Force Emergency Management Program and codify the knowledge, skills, and abilities (i.e., competencies) crucial to effective C-CBRN operations, while integrating Joint doctrine and validated operational concepts.

Innovation

During 2008, the Air Force incorporated its TTPs and modernized 47 of 145 Joint and International CBRN publications. In addition, emergency management publications were consolidated from 34 to 22.

Training

Training enables Joint, multi-national, and interagency forces to operate successfully in CBRN environments. The essential purpose of integrated DTL&E is to develop innovative, adaptive Warfighters and leaders through training and education that rapidly incorporates lessons learned from the operational environment. CBRN defense readiness training programs include realistic individual and collective skills training, and maximize the use of emerging technologies including distance learning, computer simulation, and virtual reality. Training, exercises, and leader development programs incorporate the principles for operations in CBRN environments and include realistic consideration of CBRN weapons effects on sustained operations.

Joint Training

The Joint Staff continues to provide CBRN defense training for COCOMs and Joint Task Force staffs through both resident and online versions of a Joint CBRN Familiarization Course (JCBRNFC), a Mobile Training Team course, and development and facilitation of CBRN-based senior leader seminars (SLS) and tabletop exercises (TTX). The following list depicts a description of this training:

- The JCBRNFC is designed to familiarize students with the WMD/CBRN threat, Joint Force CBRN defense, and Joint Staff officer roles and responsibilities. The online version of the JCBRNFC is posted on the JRO-CBRND portal. The course remains at the operational and strategic level, and is self-paced.
- TTXs and SLSs are designed to address specific training needs/gaps such as Pandemic Influenza, response to a nuclear or biological attack, and DoD response in a defense support of Civilian Agency environment.
- The Joint Senior Leaders' Course is sponsored and executed by the Joint Staff and hosted by the USACBRNS. The course is focused on providing senior leaders critical and relevant information on current CBRN defense and CWMD issues through an overview of the WMD strategic context, policy, and current initiatives. This forum offers a unique opportunity to exchange ideas between senior military leaders, civilian government agency leaders, and allied leaders and coalition partners. The highlight of the course is participation in the Toxic Agent Chamber of the Chemical Defense Training Facility (CDTF).

The MHS, in coordination with other agencies, conducts professional education and training for forces operating in CBRN threat environments. The Defense Medical Readiness Training Institute continues to oversee the CBRN standard operating procedures and Service certification and validation of medical CBRN courses. All military, civilian, and contract personnel assigned to the MHS are required to complete initial training and must complete sustainment training at three-year intervals.

Army Training

The Army's policy is to train all Soldiers on individual CBRN defense tasks to ensure their survival and mission continuation under any conditions. CBRN defense training is integrated into basic combat training and all phases of professional development. The MANSCEN and USACBRNS are also actively involved in finding opportunities for multi-Service CBRN training. The USACBRNS CBRN specialists' training consists of courses designed to support instruction in CBR agents, hazardous material (HAZMAT) characteristics, decontamination operations, IP clothing and equipment, CWMD, to include CBRN consequence management, and live/toxic agent training in the CDTF.

The USACBRNS continues to provide initial and advance courses in support of the WMD-CST Program. More than 300 students from the Army and Air National Guard graduated in FY 2008. In addition, courses developed to support the U.S. Army Reserve domestic reconnaissance and mass casualty decontamination mission have evolved to provide key CBRN reconnaissance and decontamination skills to support current operations in OIF/OEF and other DoD CBRNE consequence management programs, including the CBRNE Enhanced Response Force Package and CBRNE Consequence Management Response Forces.

Education and training are provided by the USAMRIID, U.S. Army Medical Research Institute of Chemical Defense, Armed Forces Radiobiology Research Institute, U.S. Army Center for Health Promotion and Preventive Medicine, and U.S. Army Medical Department Center and School. The DoD offers many of the courses to federal agencies, including the Department of State, and to civilian medical professionals. The DoD provides the courses on-site via video tape, the World Wide Web, and satellite.

Navy Training

In FY 2008, the National Naval Medical Center Office of Emergency Management deployed one of its two mobile field hospitals for staff tours and orientation. The mobile field hospital can be configured in a number of ways from a medical-surgical unit to casualty receiving and stabilizing area and even an intensive care unit in a disaster.

Accomplishment

The USACBRNS continues its cooperation with the Air Force Civil Engineer Support Agency (AFCESA) to certify students at the HAZMAT awareness, operation, and technician levels, and is actively engaged in implementing the latest National Fire Protection Association 472 standards now adopted by the DHS as the national standard for responding to WMD.

Innovation

The USACBRNS has evolved training and education from supporting traditional NBC passive defense to full-spectrum CBRN defense operations. This training and education evolution supports the development of technical and leadership skills responsive to technical innovation, evolving threats, and the application of emerging national documents such as the *NSCWMD*.

Accomplishments

- **The RAV team completed 54 official visits and provided CBR support, system repair work, and training to an additional 70 plus ships and various fleet units with use of distant support utilizing the NAVSEA CBR information Website and with the team's waterfront presence located in San Diego and Norfolk.**
- **The Navy provided state-of-the-art equipment, on-site training, and reach back support in support of a U.S. Naval Central Command UON to improve WMD/CBRN interdiction and detection. Application includes the Visit, Board, Search, and Seizure (VBSS) mission on ships of interest in and around the Persian and Arabian Gulfs.**

Marine Corps Training

The vision for the Marine Corps T&R Program is to publish a manual for every readiness-reporting unit so that core capability mission essential tasks are clearly defined with supporting collective training standards, and to publish community-based T&R manuals for all occupational fields whose personnel augment other units to increase their combat and/or logistic capabilities. This program includes plans to provide a Marine Corps training management information system that enables tracking of unit and individual training accomplishments by unit commanders and small unit leaders, automatically computing combat readiness percentage for both units and individual Marines based upon military occupational specialty (MOS) and rank (or billet). Linkage of T&R events to the Marine Corps Task List, through core capability mission essential tasks, has enabled objective assessment of training readiness in the DRRS.

Awareness of CBRN is incorporated into all levels of training and operational planning in the Marine Corps. CBRN training is specifically addressed at the small unit level to maximize force protection and unit survivability. The Marine Corps institutionalized CBRN training at its Combined Arms Exercise Facility in Twentynine Palms, CA, with a plan to incorporate CBRN training requirements into Marine Expeditionary Unit training.

Annually, individual survival standards (ISS) training is conducted for all Marines using the standards of proficiency outlined in Marine Corps Order (MCO) 3400.3F, *NBC Defense Training*. In conjunction with ISS training, all Marines complete an IPE confidence exercise once per calendar year. Units perform to the basic operating standards of proficiency and CBRN defense team operations when conducting missions under CBRN conditions. The minimum training requirements for initial instruction and sustainment of proficiency for CBRN personnel are located in MCO 3500.70, *NBC Defense T&R Manual*, which is currently under revision. In addition to the T&R Manual, the Marine Corps developed and implemented a MOS career roadmap for all enlisted CBRN defense specialists, Private through Master Gunnery Sergeant.

Air Force Training

The Air Force's C-CBRN ETE initiative has identified and ranked 331 knowledge, skills, and abilities required of Airmen to survive and operate in CBRN environments. The Air Force has published these competencies in AFMAN 10-2605, *ETE Competencies for C-CBRN Operations*. The initiative's current focus is on implementing a course of action for the education portion, and assessing the service-wide baseline and gaps for the training portion. The initiative's overall goal is to institutionalize a cross-functional, end-to-end approach to achieve a full-spectrum C-CBRN operational capability for the Air Force.

Accomplishments

- **The Air Force developed, tested, and fielded the Incident Command System (ICS) 300/400 Advanced Train-the-Trainer. The ICS 300/400 is a 32-hour in-residence course for select members of the Disaster Response Force. These courses are essential to the Air Force's goal of fully implementing Air Force Incident Management System (AFIMS) requirements established in Air Force Instruction 10-2501 by December 2009.**
- **The Air Mobility Command (AMC) ETE Initiative has enabled the command to talk directly to an average of almost 1,200 personnel each year since 2004. These 12 formal courses, some offered up to five times a year, result in over 60 opportunities for the AMC to spread the word about weighing missions criticality against the possible long-term effects of operating in a contaminated environment.**

Initiative

In 2008, the Air Force devised an action plan to sustain the capability gained in 2007 from implementing the AFIMS. The AFIMS enables Airmen to operate under a single incident management system, whether in garrison or deployed. Throughout 2008 and beyond, the focus is to sustain and improve the initial capability achieved in 2007 by fielding new and revised emergency management courses while incorporating AFIMS into plans and agreements.

Innovations

- The Air Force revised the 3E9X1 Career Field Emergency Management Education and Training Plan and specialty training skills. The revisions update terminology and address initiatives such as the Air Force Certified Emergency Manager Program, emergency management career field history, skill-level qualification requirements (specific 3E9 requirements), and provides guidance to all personnel in the 3E9 career field. In addition, more than 1,600 3E9XX training requirements in the Air Force Training Record Program were reviewed and revised.
- The Air Force Institute of Technology Civil Engineer and Services School, in coordination with the AFCESA, hosted a series of innovative Webinars featuring recently-deployed Base Civil Engineers and Mission Support Group Commanders.
- The AFCESA coordinated the first Air Force participation in the Army CBRNE Responder Technician Course. The course trained more than 130 Air Force emergency management personnel to the HAZMAT technician level.
- The Air Force Field Training Flight CBRNE Element Basic Military Training trained over 35,000 basic trainees in CBRNE defense. Innovative improvised explosive device simulation lanes provided graduating Airmen more realistic deployment training.
- The Air Force developed three new courses, revised three existing courses, and has eight new courses currently in development in 2008.

Education

Professional Military Education (PME) curricula, associated war games, and workshops will provide increased opportunities for training on CBRN defense with the purpose of addressing the CBRN threat and U.S. response capability. All DoD personnel must understand the CBRN threat, be familiar with U.S. capabilities, and comprehend their roles and responsibilities in handling CBRN defense issues. The incorporation of CWMD learning areas in the CJCSI 1800.01C, *Officer PME Policy*, as well as CJCSI 1805.01, *Enlisted PME Policy* shows the increasing priority of this area.

Joint Education

The Joint Staff continues to enhance its active role in the integration of CWMD into intermediate and senior-level PME institutions. Current initiatives by the Joint Staff support the Service and Joint PME system by providing alternatives on how to best integrate CWMD/CBRN defense. Success has been achieved through a review of curriculum and war game scenarios, SME support to war games, expert CBRN arena guest speakers, awareness training for faculty workshops to stimulate CBRN defense synergy among the institutions, and developing course curricula and other related support.

Accomplishments

- The Joint Lessons Learned Information System (JLLIS) is a DoD-automated information system that allows units across the Joint arena at every level to input and adjudicate lessons learned. The JLLIS also allows users to specifically search for C-CBRN or WMD-related lessons.
- The JRO-CBRND provided CBRN SME support to intermediate and senior college curricula and war games, Joint Advanced Warfighting School, Joint land, air, and sea simulation exercise, Strategic Decision Making Exercise, Solo Challenge Exercise, and Joint Advanced Warfighting Exercise.
- The JRO-CBRND coordinated and facilitated CBRN guest speaker presentations for multiple PME institutions and COCOMs.
- The JRO-CBRND developed and integrated curriculum into defense to civil authorities' consequence management courses for the Marine Corps Command and Staff College and the USACBRNS Captains Career Course.

Center for the Study of Weapons of Mass Destruction, National Defense University

As the CJCS-appointed lead for CWMD PME, the National Defense University's WMD Center continued or implemented several programs during FY 2008 through a MOA with the Joint Staff. These programs support the WMD Center's mandate to plan and execute an expanded mission in the area of CWMD Joint PME. The programs and initiatives include, but are not limited to the Annual Joint PME Conference on CWMD Education, Program for Emerging Leaders, and the FO/GO CWMD module. In addition, the Center created and executed a four-day-long event involving CWMD researchers, SMEs, and senior U.S. officials.

Exercises

For the foreseeable future, it is apparent that the U.S. will continue to conduct global operations that require increased partner capacity in order to limit resource intensive increases in operations tempo, end-strength, and costs. To meet these increasing demands and to conduct successful missions, it is imperative U.S. Armed Forces exercise in a realistic environment. Troops should never encounter a real-world threat or situation that they have not already experienced in exercises or other training activities. The DoD must continue to effectively integrate with the Department's CBRN interagency community partners to plan and conduct realistic and challenging exercises. The DoD will share and assist in the interagency development of training and planning of other appropriate resources with its interagency partners to realize, and standardize operational concepts with regards to the application of national power.

Joint Exercises

The Joint Staff continues to support the COCOMs and Joint Task Forces in reducing their CBRN defense-related training gaps. This is accomplished by providing CBRN SME support during the pre- and post-exercise phases. Some exercises are specifically designed to respond to CBRN-related events, while others integrated CBRN defense considerations, or 'threads,' into the exercise concept and scenario.

During FY 2008, the Joint Staff continued a formal partnership with the JFCOM to improve current and emerging Joint Force warfighting and supporting capabilities in a CBRN environment. Joint Staff exercise integrators continue to work with training event planners in the JFCOM Joint Exercise Group during each of the four phases of the Joint Training System—requirements, plans, execution, and assessment.

Army Exercises

The Army supported COCOM-critical Joint Chiefs of Staff training requirements through the conduct of approximately 80 CJCS and Army exercises during 2008. These exercises validated and improved the CBRN capability within the Army. Three of these exercises focused on Army CWMD efforts:

- The national level exercise, ARDENT SENTRY, conducted in May 2008, included the 5th Brigade, 2nd Infantry Division Stryker Brigade Combat Team and numerous CBRN units who trained with other government agencies as part of the CBRN Consequence Management Response Force's Initial operations capability demonstrations.
- During LIBERTY FOCUS exercises one and two in June and September 2008, the 20th Support Command and its subordinate elements conducted a train-up and subsequent initial operating capability.
- The VIBRANT RESPONSE exercise validated the readiness of the 1st Brigade, 3rd Infantry Division, 1st Medical Brigade, and the 82nd Combat Aviation Brigade to serve as the nation's first CBRNE Consequence Management Force.

Accomplishments

- During FY 2008, the JRO-CBRND partnered with and supported the U.S. Northern Command (NORTHCOM) during planning and execution of the tri-national Pandemic Influenza TTX. This event involved more than 100 participants from national agencies, military organizations, and other entities from Canada, Mexico, and the United States.
- The JRO-CBRND provided exercise support to the NORTHCOM, European Command (EUCOM), Strategic Command Center for Combating Weapons of Mass Destruction (SCC-WMD), DTRA, and Joint Task Force-Elimination (JTF-E) in FY 2008 in the following exercises: NORTHCOM VIGILANT SHIELD-08, NATIONAL LEVEL EXERCISE-08, Vibrant Response-08, EUCOM FLEXIBLE RESPONSE-08, DTRA NATIONAL LEVEL EXERCISE-08, SCC-WMD GLOBAL STORM-08, and JTF-E LIBERTY FOCUS-08.
- The global mobility operations (GLOMO) 2008 war game featured a chemical attack on an Aerial Port of Debarkation. GLOMO 2008 brought together the Army, Air Force, and Allied war planners to explore future concepts in airlift and aerial refueling support for the Warfighter.

Navy Exercises

The following Navy training exercises were conducted in FY 2008:

- The Navy participated in Operation GOLDEN PHOENIX 2008. San Diego County, in collaboration with the State of California and the City of San Diego, conducted a Joint civil-military emergency response exercise. The exercise focused on how well local and governmental agencies would be able to respond to a CB attack on southern California. Some of the participants in the exercise included the Marine Aircraft Group 46, U.S. Customs and Border Protection, NMRC, Biological Defense Research Directorate, and Naval Environmental Preventive Medicine Unit Five.
- A total of 24 Navy medical treatment facilities received training during the Pandemic Influenza TTX 2008.
- During the Carrier Strike Group and Expeditionary Strike Group anti-terrorism/force protection certification prior to deployment, the C3F executed a CB scenario that exercised the ship's damage control and medical/laboratory teams.
- During the RIM OF THE PACIFIC 2008 Exercise, similar biological drills were conducted onboard KITTY HAWK and BONHOMME RICHARD. In addition, a scenario exposing the VBSS Team from PINCKNEY to a chemical agent was conducted and REUBEN JAMES was subjected to a simulated Pandemic Influenza outbreak.
- A helicopter-inserted VBSS team conducted a CBRN/WMD exercise in August 2008 using the Portable CBRN/WMD Detection Capability Kit developed by the Naval Innovation Laboratory.

Marine Corps Exercises

The Marine Corps' Chemical Biological Incident Response Force (CBIRF) regularly trains with local, state, and federal responders. The CBIRF capabilities include detection and identification, casualty search and extraction, personnel decontamination, medical care and stabilization, technical rescue, and explosive ordnance disposal. In FY 2008, exercises included rapid deployment drills, pre-staged deployment events, and live agent training.

Exercises conduct by the Marine Corps in FY 2008 include the following:

- Federal: ARDENT SENTRY 2008, VIGILANT SHIELD 2008, and SUDDEN RESPONSE 2008
- State: Medical Response International Group Course
- Local: Defence R&D Canada training; Center for National Response, WV.

Air Force Exercises

All Hazard Response Training (AHRT) is a combination of WMD-incident response training and medical response exercise and training. There are now seven components to AHRT (increased from five last year): Senior leaders training, medical response training, 3E9X1 Functional Training, standardized Exercise Evaluation Team training, AFIMS TTX, Pandemic Influenza TTX, and functional exercises.

- Thirty-four installations completed AHRT in FY 2008 and 56 installations are planned for FY 2009.
- The AFCESA collaborated with the Texas A&M University Engineering Department to develop an Emergency Management Exercise System, a Web-based program to provide tools for designing and conducting operations center and command post exercises.

Update to the House of Representatives Report 109-452

The House Armed Services Committee Report, H.R. 5122 directed the ATSD(NCB) to review and perform a gap analysis on NBC defense Joint training, certification, and doctrine alignment:

> *"... in coordination with the Secretary of the Army, Secretary of the Navy, and Secretary of the Air Force, to perform a gap analysis on NBC defense training, to review NBC defense doctrine across each of the military services, and to make recommendations to the Secretary of Defense, the Senate Committee on Armed Services and the House Committee on Armed Services by October 1, 2007, regarding the implementation of joint training, certification, and doctrinal alignment for NBC defense for both the active and reserve components."*

The DoD submitted H.R. Report 109-452, *Joint Training and Certification for NBC Defense*, to the House Armed Services Committee in October 2007 to answer H.R. Report 5122. This report identified potential education and training gaps in NBC defense that inhibits the Armed Forces mission in the face of a NBC threat. Primary gaps include:

- Policy disconnects
- Lengthy processes that delay doctrine updates
- Doctrine and requirements inconsistencies
- Need for advanced military education and training
- Low priority in the Military Services for NBC defense training
- Lack of realism in NBC education and training at the individual, unit, and higher command levels.

The DoD will continue to report progress, describing steps taken and planned steps to improve such readiness requirements for CBRN defense, and requirements for training to create conditions favorable to fostering integrated CBRN defense DTL&E in future CBDP ARCs.

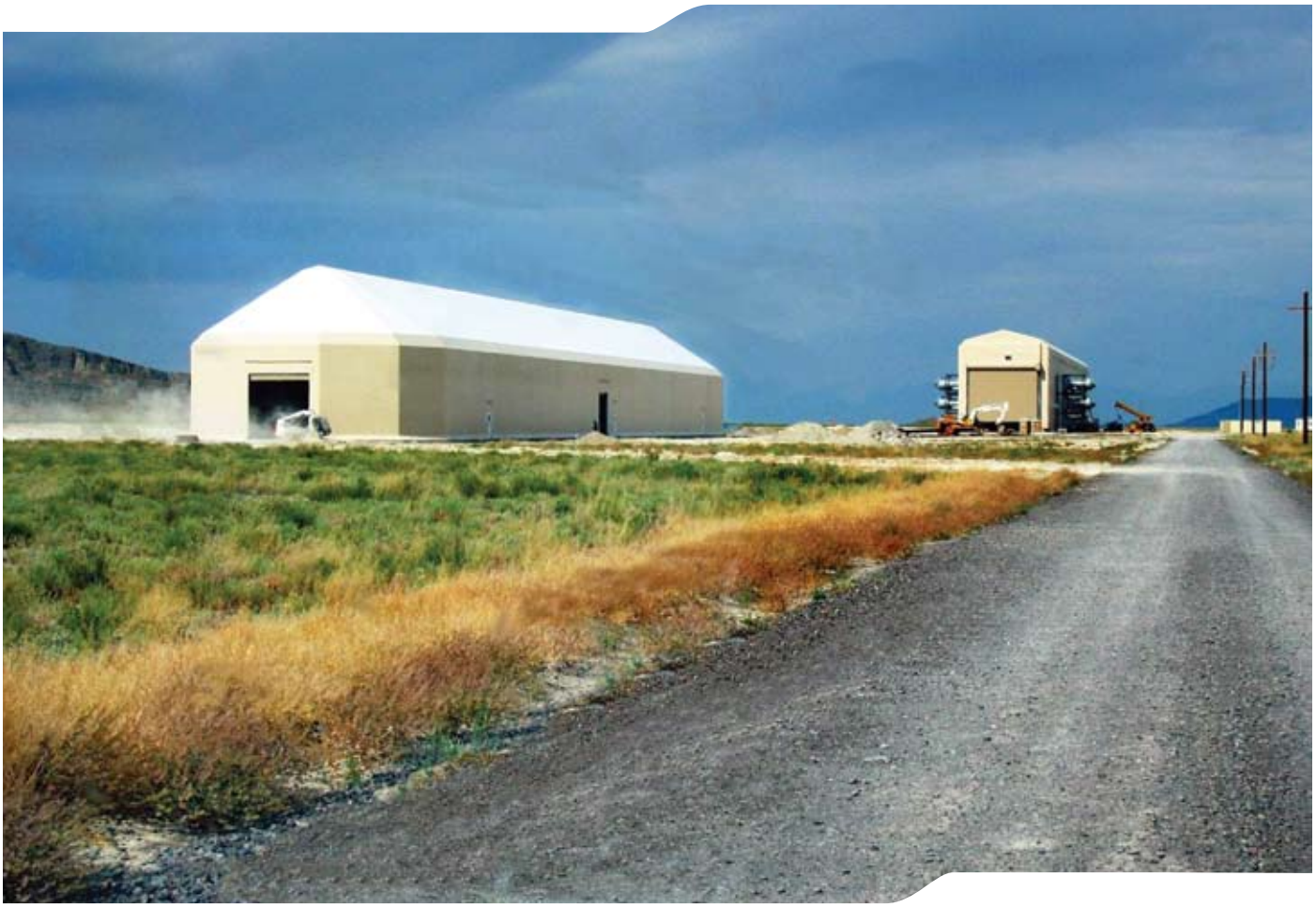
To address these potential gaps the DoD is executing two simultaneous efforts. Potential gaps are being vetted through the CWMD Passive Defense CBA. Once vetted, the Services will develop plans to mitigate or resolve those gaps and submit recommendations. Second, the DoD is developing a DoD CBRN Defense DTL&E Strategic Plan to build upon the ongoing training efforts of the services and the Joint Staff to establish an overarching strategic goal and objectives. This Strategic Plan supports the 2008 CBDP Strategic Plan by providing the broad "ends, ways, and means" necessary to achieve the desired DTL&E objectives. This plan will support the CBDP Strategic Plan's strategic objective of reinforcing training, leadership, development, and education; and is expected to be published in FY 2009.

Summary

CBRN defense Joint training and education is based on Joint doctrine to prepare U.S Armed Forces to respond to strategic and operational requirements within a CBRN environment. Numerous national and DoD-level studies/audits and observation of exercise and training events indicate a need to enhance CBRN training and education consistency, tempo and emphasis for COCOM, Joint Task Force staffs, and Joint/Service colleges.

The DoD CBRN Defense DTL&E Strategic Plan will achieve its goal and objectives through continuous facilitation, coordination, and synchronization of existing oversight processes including assessing feedback, analyzing improvement processes to monitor results, and identifying areas requiring additional emphasis. Execution of the four strategic goals will follow these established processes: evaluation of the status of the force; identify and validate gaps and shortfalls; advocate changes and improvements to resolve gaps and shortfalls; and monitor changes and improvements.

CBRN training and education focuses on the needs of three customers: the Services, COCOMs, and other DoD agencies. The Services have Title 10 responsibility to train and equip the forces to carry out their respective missions. The COCOMs ensure the availability of needed capabilities for unified action. Department agencies ensure unified action and that the Warfighter is fully supported. No one should perform a task in a real-world operation without having previously performed a similar task in training or through education.



Interagency and International Integration

The DoD CBDP coordinates its activities with other government agencies and allied nations in order to assure a fully-integrated and robust CB defense capability. Such coordination further encourages the leveraging of knowledge, laboratory and test capabilities, and funding available within the interagency community, while helping to identify and eliminate redundant efforts or projects that "reinvent the wheel." Coordination efforts throughout the CBDP are crucial to providing an integrated approach of CBRN defense capabilities in support of the National Military Strategies.

Joint Interagency Efforts

The DoD CBDP's activities are coordinated with other government agencies to gain benefit from existing and ongoing programs initiated under the auspices of other government organizations. The National Security Council Policy Coordination Committee for Proliferation, Counterproliferation, and Homeland Defense coordinates the management, development, and implementation of national security policies related to CB defense activities. Additionally, the CBDP currently has formal coordination efforts with the DARPA, Counterproliferation Program Review Committee (CPRC), Technical Support Working Group (TSWG), DHS S&T Directorate, and DHHS.

The CBDP recognizes the importance of interagency collaboration to mitigate the broadened threat context. The CBDP and JPEO-CBD work collaboratively with the DARPA and have performance standardization projects for biological sampling methods and polymerase chain reaction assay equivalency with the CDC and DHS. The JPEO-CBD contributes to the Biomonitoring MOU by governing the development of a coordinated environmental BW surveillance architecture with the DHS, U.S. Postal Service, DHHS, and EPA.

The CBDP is working with the DARPA to shorten the development time and decrease the costs of vaccine development for biological medical systems. The CBDP also works with the DHHS to form a Joint National Stockpile for fielded products and collaborate on numerous developmental products. A National Stockpile exists for the Smallpox vaccine (ACAM2000™) and for the Anthrax vaccine (BioThrax™). The CBDP is working with the DHHS to refine integrated processes and procedures for ordering, distribution, billing, and payment.

Initiatives

- **The Services, DoD, and other government agencies are working to inform U.S. policy decisions to optimize the balance between risks associated with allowing access to biological select agents and toxins (BSAT) for research, and the importance of BSAT research for force and public health protection. Currently, there is ongoing review and evaluation of the efficacy and cost/benefit of laboratory security and personnel reliability programs which have been instituted by the DoD and Services since 2001.**
- **The Integrated National Biodefense Medical Countermeasures Portfolio Initiative is an integrated, end-to-end national biodefense portfolio for medical countermeasure products among the National Institute of Allergies and Infectious Diseases, Biological Advanced Research and Development Authority (BARDA), DARPA, and CBDP (DTRA and JPM-CBMS), including the TMTI. The integrated interagency portfolio will enable cost-sharing, knowledge-sharing, people-sharing, and program-sharing to maximize the likelihood of success in the shortest amount of time with the largest impact for the investment dollar.**
- **The DoD, U.S. Environmental Protection Agency (EPA), and DHS agreed to establish an overarching memorandum of understanding (MOU) in the area of CB defense. This MOU will encourage and enable the agencies to more quickly establish Joint projects, exchange data, and coordinate or co-fund programs of mutual interest without having to set-up separate agreements each time.**

The JPEO-CBD collaborated with the BioWatch Program to co-locate DoD and DHS bio-detection technologies on Andrews Air Force Base. The BioWatch provides a bio-aerosol environmental monitoring system to our nation's largest cities for early detection of biological attacks.

This partnership resulted in several significant accomplishments:

- Enhancing assay equivalency work currently underway between the CDC and DoD laboratories
- Developing multi-agency (national and local) concepts of operations for event notification – the genesis for developing

an expanded CONOPs for the National Capital Region

- Initiating collector re-site activity within the National Capital Region that seeks to optimize DoD and DHS biomonitoring capabilities – a strong first step in solidifying the National Bio-monitoring Architecture
- Using up to 25 DoD installations that have bio-detection capability that provides additional BioWatch geographic coverage.

The requirement to rapidly-detect and identify CBRN compounds is essentially the same for both military and civilian response. Many of the threat agents across the military and civilian spectrums are identical, which drives the development of complimentary capabilities and technologies. Training requirements are also similar and in many cases, identical; the greatest difference is between the operational environments. Military environments are normally harsher and more austere, requiring a higher level of ruggedized equipment. Additional interagency partnerships are outlined in the table below.

CBDP Enterprise Interagency Relationships

DARPA	Develops revolutionary new detection, diagnostics, and decontamination of CB threats. The DARPA's programs are intended to complement the CBDP by anticipating and developing novel defenses against future threats. The DARPA invests primarily in early technology development phases and the demonstration of prototype systems.
CPRC	Interagency executive committee that reports on activities and programs to combat WMD.
TSWG	Interagency forum that identifies, prioritizes, and coordinates interagency and international R&D requirements for combating terrorism.
DHS (S&T Directorate)	Primary R&D arm of the DHS that guides and organizes research efforts to meet emerging and predicted needs.
DHHS	Under Project Bioshield/the BARDA, the DHHS conducts research, development, and procurement of safe and effective CBRN medical countermeasures. The CBDP and DHHS work cooperatively in these endeavors.
CDC	The CDC, an agency of the DHHS, supports the U.S. by managing the SNS. The DoD acquires Smallpox and Anthrax vaccine from the SNS. The CDC and DoD work together in the refinement of their respective Bio-surety programs.
EPA	The EPA is responsible for remediation and recovery of critical infrastructure following an attack with WMD as well as for protecting the nation's water supply from accidental or deliberate contamination.

Initiative

Construction was underway on the Sample Receipt Facility (SRF) in FY 2008—a uniquely-specialized sample handling, analysis, and forensics facility nearing completion at the ECBC on the Edgewood Area of Aberdeen Proving Ground (APG), MD. The SRF is a collaborative effort, funded by the DoD, DHS, and Federal Bureau of Investigation (FBI).

Accomplishments

- The DoD now acquires Anthrax Vaccine Adsorbed (BioThrax™) and ACAM2000™, the newly-licensed Smallpox vaccine that replaced Dryvax™, from the SNS, via Economy Act orders.
- In diagnostics, transitioned a manual sample preparation process to the JPM-CBMS.
- Transitioned a multi-center automated sample preparation data report to the JPM-CBMS, JPEO-CBD, EPA, and FBI
- Transitioned 40 assay design packages to the JBAIDS and CRP from The Technical Cooperation Program (TTCP) Technical Publication (TP)-14, Protection & Sustainment of Physical and Cognitive Performance.

Innovations

- Co-location of DoD and DHS assets. The DHS Chemical Security Analysis Center was established at the DoD's APG and the DHS National Biodefense Analysis and Countermeasures Center was set up at Fort Detrick. These facilities thus flaunt the conventional centralization and exclusivity of agency assets and have stimulated communication and sharing of personnel and technical expertise between the agencies.
- Joint funding of technical projects. Many projects have potential application to both military defense and homeland security. The CBDP has therefore started promoting co-funding of projects with other agencies, such as the DHS, DARPA, and EPA. This allows access to more technology within the budget while strengthening government oversight due to the involvement of multiple SMEs from different agencies. This further promotes transfer of technology from R&D to fielded application as project funding transitions from early-phase agencies to acquisition-oriented agencies. Duplicative funding of a project by different agencies is also reduced by this approach.
- The DoD, EPA, and DHS established an informal working group to explore ways to accelerate and expand the integration of technology development among the agencies. The group is considering traditional and non-traditional ways to enhance cooperation among the agencies' principal investigators and program managers.

Joint International Efforts

The CBDP leverages international programs to gain access to foreign technology and infrastructure, mitigate risk in the R&D process, and establish multi-national standardized test procedures and common data. The two main objectives of international cooperative CBRN defense programs are to reduce defense system acquisition costs through collaboration in the areas of development, production, and support; and to enhance interoperability with coalition partners. The magnitude of these cooperative efforts covers all the capability areas of CB defense (i.e., sense, shape, shield, and sustain).

In September 2007, the CBDP broadened its international reach by drafting a multilateral Strategic Implementation Plan and Roadmap to the year 2025 for the AUSCANUKUS CBR MOU. This effort will allow expanded CBDP information exchange with AUSCANUKUS. As part of the international CBR MOU, the CBDP participated in a series of meetings, working groups, and an Interagency Task Force, interacting with Israel, Singapore, Poland, Sweden, Japan, Thailand, and NATO nations. These interactions allow for increasing information exchange, developing cooperative relationships, and ensuring program efficiencies.

The CBDP greatly benefits from international T&E collaboration in the CBR arena under the auspices of the Test, Evaluation, and Simulation Working Group (TESWG), which is chartered by the AUSCANUKUS CBR MOU and chaired by the Army TEO. The TESWG meets bi-annually and is working to provide Multi-National Test Operating Procedures (MTOP) as well as identifying opportunities for collaboration on test events and sharing of test data. In FY 2008, the TESWG drafted MTOPs for information systems and published a MTOP guidebook. The TESWG initiated collaboration between international T&E and M&S efforts to establish business cases for use of T&E data to validate M&S programs and to define T&E data needs for M&S efforts.

The CBDP is actively involved in numerous cooperative efforts in CB defense requirements, technology, and material developments through bilateral, multi-lateral, and allied agreements and structures. These include: TTCP, CBR MOU activities, NATO Joint Capability Group on Chemical, Biological, Radiological, and Nuclear Defence (JCG-CBRN) activities, NATO Research and Technology Organization (RTO), and bilateral fora with the United Kingdom, Japan, Singapore, Australia, Republic of Korea, and other countries with efforts in CB defense. These venues link the CBDP to government, military, and non-military RDT&E players involved in CB defense material development efforts. The JPEO-CBD participates in the foreign military sales process ensuring increased interoperability. Cooperative development activities under these programs reduce U.S. development costs through burden sharing and leveraging of others' significant investments in CB defense and increase access to the broadest panoply of CB defense technologies. The JSTO-CBD participates in cooperative S&T development through information exchange and collaborative research in bilateral and multilateral venues.

The JPEO-CBD is increasing the leveraging of existing DoD and broader U.S. government presence throughout the world as it searches for the best science and most advanced technologies to meet its program requirements. Through more than 34 offices with a presence in 21 countries on six continents already in existence, and executing missions for their respective DoD patrons, the JPEO-CBD intends to ensure it is aware of all potentially-beneficial technologies, both developing and available, to meet CB defense requirements. Additionally, the JPEO-CBD works with other U.S. government agencies participating in CB defense technology developments globally. Together, these efforts will ensure an ability to identify, assess, develop, and exploit military and civilian technology and material developments in CB defense on a global basis at the service of DoD needs.

The CBDP continues to identify and leverage global capabilities that address program requirements. Such cooperation is critical to ensure access to the best CB defense research and technologies available worldwide and to integrate equipment and procedures with U.S. allies. The CBDP effectively leverages international programs to gain unique access to foreign research, technology, and infrastructure to mitigate risk in the R&D process and establish multinational standardized test procedures. International agreements provide the legal and procedural framework for international cooperation in CB defense. Further, the JPEO-CBD participates as a DoD representative in the following activities:

- AUSCANUKUS CBR MOU
- Joint Venture Oversight Group – United Kingdom
- NATO JCG-CBRN and other NATO venues
- Counterproliferation Working Groups (CPWG)
    - United States-Israel
    - United States-Singapore
    - United States-South Korea
- United States-Japan Chemical and Biological Defense Working Group (CDWG)
- Senior National Representatives-Army with eight countries when CB defense issues are on the agenda.

Specifically, the JPEO-CBD is signatory to the following agreements:

- Plague vaccine Project Agreement (PA) with the United Kingdom and Canada (JPM-CBMS)
- PA on ColPro with the United Kingdom
- Engineer and Scientist Exchange Program (ESEP) with Germany.

Lastly, the JPEO-CBD leverages other DoD international S&T offices located overseas to identify technologies that meet its requirements. These include the following:

- Six Army International Technology Centers
- Four Office of Naval Research Global Offices
- Four Air Force Office of Scientific Research Offices
- Army and Navy medical community offices
- U.S. Army Corps of Engineers offices
- Yuma overseas presence.

The JSTO-CBD manages and executes CBDP International S&T activities, including the following:

- Promoting collaboration and harmonization of CB defense S&T International research activities
- Developing and managing CB defense S&T international agreements including information exchange agreements, data exchange agreements, PAs, the ESEP, and equipment and materiel transfers with the United Kingdom, Singapore, Australia, and Israel.
- The JSTO-CBD serves as the national lead, and Executive Chair for TTCP CBD Group. Collaborative areas as well as scientist, equipment, material, and information exchange under this subgroup include the following:
  - TP-4 BW Medical Countermeasures
  - TP-9 Hazard Assessment
  - TP-10 Detection of Biological Agents
  - TP-11 IP
  - TP-14 Rapid Diagnostics
  - TP-15 Hazard Management
  - Administrative Guide (AG)-53 Agent Fate
  - AG-54 Virtual Battle Space.
- Participates in all CBDP-related NATO RTO activities.
  - Sensors and Electronics Technology
  - Systems Analysis and Studies
  - Human Factors in Medicine.
- Leads S&T activities in support of Office of the Under Secretary of Defense counterproliferation policy-led groups.

The CBDP supports a policy of cooperation and collaboration that recognizes the importance of allies in the effort to develop capabilities to counter WMD. International cooperation fosters the relationships necessary to achieve mutual benefits regarding costs and interoperability. Clearly, it remains in the U.S. interest to continue international cooperative CB defense programs.

Accomplishments

- **The NATO Allied Engineering Publication-7 was reviewed to provide the capability development and materiel acquisition community with guidelines, test procedures, and acceptance criteria for designing military equipment. These guidelines were provided to ensure that materiel used on the battlefield will survive CBRN hazards and can be operated by personnel in a protective posture. This publication also provides information regarding the impact of decontamination on different materials. The Services and JRO-CBRND doctrine representatives deliberated on and agreed on this keystone multi-Service doctrine for CBRN operations publication.**
- **Completed the CBR MOU Master Roadmap to the year 2025 that identifies each member countries' capabilities, aligns national priorities, and identifies and prioritizes gaps for Joint consideration. The draft roadmap followed the multilateral Strategic Implementation Plan and Roadmap developed in 2007. It needs to be ratified by each member country, after which it will serve to guide the establishment of new international working groups, Joint development or T&E projects, and possible Joint acquisitions.**
- **Following a thorough, detailed program review by the JPM-CBMS, the JPEO-CBD decided to solely fund the development of the U.S. Plague vaccine candidate through FDA licensure. Both the United Kingdom Ministry of Defence and the Canadian Department of National Defence concurred with this decision and a new project arrangement under the CBR MOU is expected to be signed by all three nations in FY 2009.**

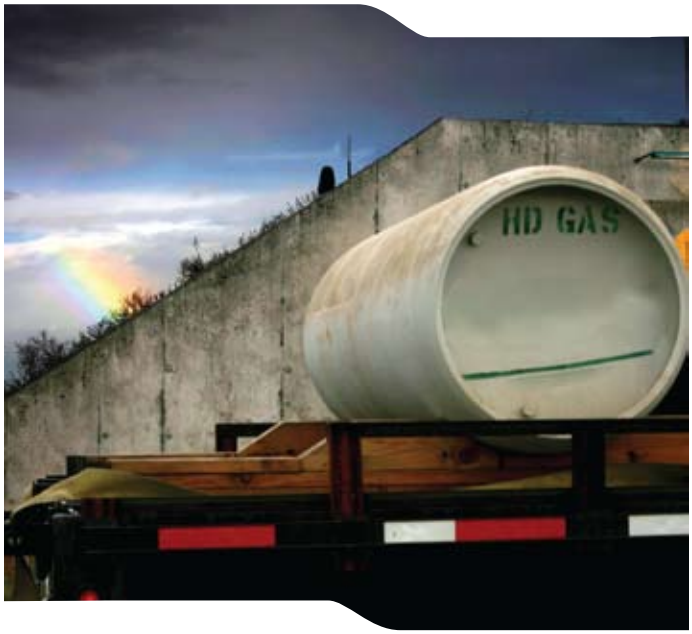
Chemical Weapons Convention

The CWC opened for signature on January 13, 1993 and entered into force on April 29, 1997. As of August 2008, 184 countries, including the United States, are member states of the CWC. The Second CWC Review Conference convened April 17-18, 2008. In general, the Review concluded that the CWC has accomplished its stated goals. The 13th session of the Conference of the States Parties, the highest policy-making organ of the Organization for the Prohibition of Chemical Weapons (OPCW), convened in The Hague, Netherlands from December 2-5, 2008.

In 2008, the DoD hosted 89 inspections and visits at CW storage, destruction, and Schedule 1 chemical production facilities. The Army and the DTRA continue to host and escort inspectors from the OPCW Technical Secretariat (TS). The OPCW is charged with overseeing worldwide implementation of the CWC. TS inspectors conduct continuous and non-continuous monitoring at DoD CW destruction facilities and systematic inspections at DoD CW storage, and Schedule 1 chemical production facilities. The DoD completed the destruction of the last of its former CW production facilities in 2007. The OSD, Joint Staff, Services, and DTRA provide technical experts to support activity at the U.S. Delegation to the OPCW at The Hague.

The DTRA provides CWC orientation, training, and associated mission-support training (i.e., treaty escort, HAZMAT, and Hazardous Waste Operations and Emergency Response Training) to U.S. government national escorts and other treaty compliance personnel. The DTRA ensures that all escorts are trained and ready to receive OPCW TS inspection teams.

The Department of Commerce (DOC) is the lead agency for chemical industry inspections. The DTRA continues to support the DOC with inspections of OPCW technical equipment. U.S. chemical industry inspections began in May 2000. The OPCW TS conducted 18 chemical industry inspections in 2008.



The DoD conducts a Chemical Weapons Implementation Working Group (CWIWG) chaired by the CW Treaty Manager and the Principal Deputy, ATSD(NCB) to implement the CWC. Representatives of the OSD, Joint Staff, Services, and DoD agencies and activities coordinate their efforts through quarterly meetings to ensure proper implementation of the CWC. The CWIWG schedules small group meetings as needed to address specific requirements in support of the CWIWG.

A Compliance Review Group (CRG), also chaired by the CW Treaty Manager, was established within the DoD to address CWC compliance concerns, as needed. During 2008, the CRG met several times to address the compliance of planned activities within the DoD.

The Army's Chemical Materials Agency (CMA) has the mission to destroy U.S. CW stockpiled material located in Anniston, AL; Newport, IN; Pine Bluff, AR; Umatilla, OR; and Tooele, UT. The CMA has completed destruction at Aberdeen, MD and Newport, IN under continuous monitoring by OPCW inspection teams. The DoD's Assembled Chemical Weapons Alternatives Program has the responsibility to destroy the CW stockpile material at Blue Grass, KY and Pueblo, CO. Both organizations work through the OSD to ensure compliance with CWC provisions and ensure maximum protection of the public and the environment.

Safety Orientation for Inspectors

All OPCW inspectors who conduct continuous monitoring at U.S. chemical demilitarization facilities are required to attend a 32-hour safety orientation. This orientation, presented by the Army, is divided into two sections: a 24-hour health and safety orientation (HSO) course, which is a U.S. government requirement for all personnel who must be present on a more than short-term basis at U.S. chemical demilitarization facilities; and an eight-hour ammunition safety course. A 48-hour demilitarization protective ensemble (DPE) procedures course is required only for those inspectors designated by the OPCW TS, whose responsibilities would include the use of such protective equipment.

Roughly 179 OPCW TS inspectors have attended HSO training and nine inspectors have attended the DPE course in 2008. The HSO training is normally conducted at The Hague, but may be conducted at the CDTF at APG. The DPE course is conducted at the CDTF. The DTRA provides U.S. government national escort support for OPCW inspectors while they attend required training in the United States. The DTRA ensures that all inspectors receive the required training.

Preparation of Defense Installations

The DoD, Services, and DTRA have developed individual implementation and compliance plans to provide guidance for their commands and activities under the CWC. The Services have individually established implementation support offices, which participate actively at the DoD CWIWG, provide Service policy direction, and liaise with their major commands to ensure that all military elements are fully prepared for inspections under the CWC.

The Services continue to coordinate actively with the OSD and DTRA to prepare DoD installations for inspections under the CWC. All defense installations are subject to declarations under CWC requirements. Installations that are subject to challenge inspections, even though not declarable, have been visited by Service representatives and DTRA technical experts. The DTRA will continue to support site assistance visits and Army treaty implementation and compliance meetings.

All Services have held exercises to test their preparedness for short-notice CWC challenge inspections. Such exercises involve the active participation of Service, OSD, DTRA, and other DoD representatives in the roles they would assume during a challenge inspection. The DoD and the Services have exercised written DoD guidance and procedures to test the operational readiness of personnel and facilities. The Services have initiated efforts to ensure that in the case of a challenge inspection, affected commands take timely and appropriate measures, based on lessons learned, to demonstrate compliance while protecting security concerns.

In coordination with the Army, the DoD sponsored a five-day mock and a three-day tabletop challenge inspection exercise in 2008, using the Letterkenny Army Depot, PA as the inspection site. The DoD's overall objective was to validate the National Escorts' and Army's installation advance teams' operations procedures, DoD compliance guidance, exercise the CRG process, address and validate public affairs guidance, and exercise the host team's internal operations process.

Accomplishment

The ECBC's Research and Technology Directorate participated in and scored an "A" on the 23rd OPCW Proficiency Test, with no false positives/false negatives in the identification of seven reportable compounds in six samples reflecting potential challenge inspection scenarios. The ECBC Forensic Analytical Center and the Lawrence Livermore National Laboratory Forensic Science Center are the two designated U.S. laboratories for analytical support of challenge inspection and proficiency tests under the CWC.

Defense Treaty Inspection Readiness Program

The Defense Treaty Inspection Readiness Program (DTIRP), for which the DTRA is the executive agent, provides arms control implementation advice and assistance to sites subject to onsite inspection using specially trained personnel, analyses, and educational activities. In 2008, the DTIRP supported the U.S. Army CMA, Defense Security Service Academy, and other Services to provide arms control security advice and tailored training for new personnel. The DTIRP has provided, and will continue to provide, arms control vulnerability assessment teams in support of any requirement to assess risks to critical national security assets, U.S. industry, and research institutions. Program personnel are actively engaged throughout the arms control and security arenas to remain current and focused on present arms control security challenges.

Technical Equipment Inspection Program

The Technical Equipment Inspection (TEI) Program ensures that OPCW TS verification equipment meets U.S. safety, environmental, and security requirements through a familiarization process authorized by the OPCW Conference of States Parties. Familiarization results are documented in the U.S. Certification Report of CWC OPCW TS Equipment. In addition, the TEI verifies and confirms OPCW equipment entering and exiting the United States and performs chemical agent monitoring of inbound equipment for all inspection teams at the point of entry. Chemical agent monitoring is conducted to protect U.S. and OPCW personnel and prevent inaccurate findings resulting from preexisting contaminants on the OPCW verification equipment.

Article X Assistance and Other Assistance

Under Article X of the CWC, a State Party to the treaty may make an appeal for assistance through the Director-General of the TS. In accordance with a condition established in the U.S. Senate's Advice and Consent to the Ratification of the CWC, the United States will provide "no assistance…other than medical antidotes and treatment," which the U.S. government deems necessary to those CWC States Parties that have requested assistance under Article X of the CWC.

Under the CWC, the DoD has provided neither CW detection equipment nor assistance in the transportation, storage, and destruction of CW to other States Parties, except that being provided to Russia and Albania under the DoD's Cooperative Threat Reduction Program.

The integration of the international and interagency communities facilitates interoperability and maximizes the effectiveness of CBDP capabilities. This partnership provides numerous benefits: an increased knowledge base, expanded access to technology and infrastructure, R&D process mitigation, data sharing, and standardized multinational test procedures while assuring the judicious utilization of CBDP resources.

Summary

The CBDP continues to accomplish many of its objectives supporting the Program's overall vision and strategic goals. The CBDP continues to focus on providing the Warfighter with the best defensive technologies and support available; advancing program integration, sustainability, and coordination both within the DoD and across federal and international agencies; and advancing the development and fielding of both materiel and non-materiel CBRN defense solutions. All CBDP initiatives, innovations, and accomplishments remain focused on achieving the four fundamental CBDP strategic goals:

1. **Operational Goal –** Provide Operational Capability to the Joint Force
2. **Future Goal –** Define and Develop Transformational Capabilities
3. **Institutional Goal –** Sustain the Force to Operate Jointly and Effectively
4. **Management Goal –** Improve Management Practices to Fulfill Enterprise Strategic Roles and Missions.

The CBDP seeks to ensure that DoD operations are unconstrained by CBRN threats and that U.S. Armed Forces can fight and decisively win in CBRN environments. The Program seeks to advance CBR defense capabilities to build readiness for current and future challenges. In order to remain effective and continue to support military readiness, operational success, and defense of the homeland, the CBDP depends on continued congressional support in several priority areas to maintain the forward momentum of the Program:

- Adequate resources to ensure procurement and fielding of improved defensive capabilities essential to the Armed Forces' ability to operate in any environment, unconstrained by WMD or CBRN contamination.
- Stable funding to fully exploit the advanced S&T innovations necessary to successfully counter developing and future CBR weapons.
- Adequate long-term investment in infrastructure to enhance RDT&E capabilities, including modernization and construction of laboratories and test facilities to ensure development of advanced countermeasures against current and emerging CBRN threats.
- Sufficient resources to support the transition to a new FPC, and maintaining capabilities and forces to wage multiple campaigns in an overlapping timeframe.
- Adequate resources to ensure sustainment and support of fielded CBDP equipment and consumable products.

Path Forward

To ensure that U.S. Warfighters continue to lead the world in CB operability, the CBDP will continue to develop new defensive capabilities in anticipation of the continued evolution of WMD threats. Requirements outlined in the FY 2010 to 2015 POM will be utilized to ensure that DoD CB defense capabilities are built to enhance readiness for current and future CBRN challenges. Over the FY 2010 to 2015 time period, major efforts will focus on numerous forward-looking innovations including the following:

- Research into active measures for CB stand-off detection
- Advanced materials for improved filtration and protection systems
- Advanced decontaminants
- Multi-functional smart materials for CB defense capabilities
- Biological pretreatments/viral vaccines
- Animal model development
- Radiological countermeasures
- Medical chemical defense
- Diagnostics/therapeutics.

The CBDP Enterprise will also undertake several initiatives to improve overall management effectiveness and coordination of the CBDP both within the Services and within other government agencies through expanding collaborative contacts within the intergovernmental and international community, especially in the areas of S&T and RDA.

The CBDP will continue to develop new defensive capabilities in anticipation of the continued evolution of WMD threats and potential threats, including genetically-engineered biological pathogens and next-generation chemical agents, to ensure that U.S. Armed Forces are prepared to operate in CBRN environments. To maintain the ability to counter the existing and emerging CBRN threats and to gain a competitive advantage, continued congressional support is essential to sustain progress and to meet the critical operational needs of U.S. Warfighters and homeland defense requirements.

Acronyms

A

AAS	Advanced Anticonvulsant System
ACADA	Automatic Chemical Agent Detector and Alarm
ACTD	Advanced Concept Technology Demonstration
AFCESA	Air Force Civil Engineer Support Agency
AFIMS	Air Force Incident Management System
AFMAN	Air Force Manual
AFS	Alternative Footwear Solution
AG	Administrative Guide
AHRT	All Hazards Response Training
ALS	Analytical Laboratory System
AMC	Air Mobility Command
AMP	Accelerated Manufacture of Pharmaceuticals
APB	Acquisition Program Baseline
APG	Aberdeen Proving Ground
ARC	Annual Report to Congress
ASC	Active Stand-off Chamber
AUSCANUKUS	Australia, Canada, United Kingdom, and United States
ATD	Advanced Technology Demonstration
ATSD(NCB)	Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs

B

BARDA	Biological Advanced Research and Development Authority
BoNT	Botulinum Neurotoxin
BSAT	Biological Select Agents and Toxins
BW	Biological Weapons
BWA	Biological Warfare Agent

C

C2	Command and Control
C3F	Commander, Third Fleet
C4ISR	Command Control Communications Computers Intelligence Surveillance and Reconnaissance
CB	Chemical and Biological
CBA	Capabilities Based Assessment
CBART	Chemical Biological Agent Resistance Test
CBDP	Chemical and Biological Defense Program
CBIRF	Chemical Biological Incident Response Force
CBME	Chemical and Biological Material Effects Database
CBR	Chemical, Biological, and Radiological
CBR MOU	The Australia, Canada, United Kingdom, and the United States Memorandum of Understanding on Research, Development, and Acquisition of Chemical, Biological, and Radiological Defence Materiel
C-CBRN	Counter Chemical, Biological, Radiological, and Nuclear
CBRN	Chemical, Biological, Radiological, and Nuclear
CBRNE	Chemical, Biological, Radiological, Nuclear, and (High Yield) Explosives
CCSI	Common Chemical, Biological, Radiological, and Nuclear Sensor Interface
CDC	U.S. Centers for Disease Control and Prevention
CDD	Capability Development Document
CDR	Critical Design Review
CDTF	Chemical Defense Training Facility
CDWG	Chemical and Biological Defense Working Group
CJCS	Chairman, Joint Chiefs of Staff
CJCSI	Chairman of the Joint Chiefs of Staff Instruction
CMA	U.S. Army Chemical Materials Agency
COCOM	Combatant Command
CoIPro	Collective Protection
CONOPS	Concept of Operations
CONUS	Continental United States
COTS	Commercial Off the Shelf
CPD	Capability Production Document
CP DEPMEDS	Collectively Protected Deployable Medical System
CPM	Capability Portfolio Management
CPRC	Counterproliferation Program Review Committee
CPWG	Counterproliferation Working Group
CRG	Compliance Review Group
CRP	Critical Reagents Program
CUGV	Chemical, Biological, Radiological, and Nuclear Unmanned Ground Vehicle
CW	Chemical Weapons
CWA	Chemical Warfare Agent
CWC	Chemical Weapons Convention
CWIWG	Chemical Weapons Implementation Working Group
CWMD	Combating Weapons of Mass Destruction

D

DARPA	Defense Advanced Research Projects Agency
DepSecDef	Deputy Secretary of Defense
DFoS	Decontamination Family of Systems
DHHS	U.S. Department of Health and Human Services
DHS	U.S. Department of Homeland Security
DLA	Defense Logistics Agency
DOC	Department of Commerce
DoD	Department of Defense
DoDD	Department of Defense Directive
DoDI	Department of Defense Instruction
DOTMLPF	Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, and Facilities
DPE	Demilitarization Protective Ensemble
DPG	Dugway Proving Ground
DRRS	Defense Readiness Reporting System
DTC	Dynamic Test Chamber
DTIRP	Defense Treaty Inspection Readiness Program
DTL&E	Doctrine, Training, Leadership, and Education
DTRA	Defense Threat Reduction Agency

E

EBD	Expeditionary Biological Detection
ECBC	Edgewood Chemical Biological Center
EPA	U.S. Environmental Protection Agency
ESEP	Engineer and Scientist Exchange Program
ETE	Education, Training, and Exercise
EUCOM	European Command

F

FBI	U.S. Federal Bureau of Investigation
FCB	Functional Capabilities Board
FDA	U.S. Food and Drug Administration
FO/GO	Flag Officer/General Officer
FoS	Family of Systems
FPC	Force Planning Construct
FRP	Full Rate Production

G

GLOMO	Global Mobility Operations
GLP	Good Laboratory Practice
GOTS	Government Off the Shelf

H

HAZMAT	Hazardous Materials
HD	Sulfur Mustard
H.R.	House of Representatives
HRDS	Human Remains Decontamination System
HSO	Health and Safety Orientation

I

IBRD	Interagency Biological Restoration Demonstration
ICAM	Improved Chemical Agent Monitor
ICEMP	Individual Chemical Equipment Management Program
ICS	Incident Command System
IFS	Integrated Footwear System
IND	Investigational New Drug
IOC	Initial Operational Capability
IOP	International Oversight Panel
IP	Individual Protection
IPE	Individual Protective Equipment
IPP	Installation Protection Programs
ISS	Individual Survival Standards
IT	Information Technology

J

J-8	Force Structure, Resources, and Assessment Directorate
JABT	Joint Ambient Breeze Tunnel
JACKS-RW	Joint Acquisition Chemical, Biological, Radiological, and Nuclear Knowledge System Reporting Warehouse
JB2GU	Joint Service Lightweight Integrated Suit Technology Block II Glove Upgrade
JBAIDS	Joint Biological Agent Identification and Diagnostic System
JBPDS	Joint Biological Point Detection System
JBTDS	Joint Biological Tactical Detection System
JC3	Joint Service Lightweight Integrated Suit Technology Chemical and Biological Coverall for Combat Vehicle Crewman
JCAD	Joint Chemical Agent Detector
JCBRAWM	Joint Chemical, Biological, and Radiological Agent Water Monitor
JCBRNFC	Joint Chemical, Biological, Radiological, and Nuclear Familiarization Course
JCD-CBRND	Joint Combat Developer for Experimentation for Chemical, Biological, Radiological, and Nuclear Defense

JCG-CBRN	Joint Capability Group on Chemical, Biological, Radiological and Nuclear Defence
JCIDS	Joint Capabilities Integration and Development System
JCSD	Joint Contaminated Surface Detector
JCTD	Joint Capability Technology Demonstration
JCWS	Joint and Combined Warfighting School
JEAP	Joint Equipment Assessment Program
JECP	Joint Expeditionary Collective Protection
JEM	Joint Effects Model
JFCOM	Joint Forces Command
JILA	Joint Independent Logistics Assessment
JLLIS	Joint Lessons Learned Information System
JMAR	Joint Medical Asset Repository
JMR	Joint Materiel Release
JNBCRS	Joint Nuclear, Biological, and Chemical Reconnaissance System
JOEF	Joint Operational Effects Federation
JP	Joint Publication
JPACE	Joint Protective Aircrew Ensemble
JPEO-CBD	Joint Program Executive Office for Chemical and Biological Defense
JPM	Joint Project Manager
JPM-BD	Joint Project Manager for Biological Defense
JPM-CBMS	Joint Project Manager for Chemical and Biological Medical Systems
JPM-CoIPro	Joint Project Manager for Collective Protection
JPM-Decon	Joint Project Manager for Decontamination
JPM-Guardian	Joint Project Manager for Installation Protection (Guardian)
JPM-IP	Joint Project Manager for Individual Protection
JPM-IS	Joint Project Manager for Information Systems
JPM-NBC CA	Joint Project Manager for Nuclear, Biological, and Chemical Contamination Avoidance
JPS	Joint Portal Shield
JROC	Joint Requirements Oversight Council
JRO-CBRND	Joint Requirements Office for Chemical, Biological, Radiological, and Nuclear Defense
JSAM	Joint Service Aircrew Mask
JSGPM	Joint Service General Purpose Mask
JSLSCAD	Joint Service Lightweight Stand-off Chemical Agent Detector
JSLIST	Joint Service Lightweight Integrated Suit Technology
JSPDS	Joint Service Personnel/Skin Decontamination Systems
JSTDS-SS	Joint Service Transportable Decontamination System-Small Scale
JSTO-CBD	Joint Science and Technology Office for Chemical and Biological Defense
JTF-E	Joint Task Force - Elimination
JUONS	Joint Urgent Operational Needs Statement
JWARN	Joint Warning and Reporting Network

K

KPP	Key Performance Parameter

L

LCMIP	Life Cycle Management Improvement Program
LRIP	Low Rate Initial Production

M

M&S	Modeling and Simulation
MAGTF	Marine Air Ground Task Force
MANSCEN	Maneuver Support Center
MCO	Marine Corps Order
MCWP	Marine Corps Warfighting Publication
MDA	Milestone Decision Authority
MDAP	Major Defense Acquisition Program
MHS	Military Health System
MILCON	Military Construction
MIST	Man-In Simulant Test
MOA	Memorandum of Agreement
MOS	Military Occupational Specialty
MOU	Memorandum of Understanding
MS	Milestone
MTOP	Multi-National Test Operating Procedure
MTTP	Multi-Service Tactics, Techniques, and Procedure

N

NATO	North Atlantic Treaty Organization
NAVSEA	Naval Sea Systems Command
NBC	Nuclear, Biological, and Chemical
NBCRV	Nuclear, Biological, and Chemical Reconnaissance Vehicle
NBIC	Nanotechnology, Biotechnology, Information Technology, and Cognitive Sciences
nFR	Non-Flame Resistant
NMRC	Naval Medical Research Center

NMSCWMD	National Military Strategy to Combat Weapons of Mass Destruction
NORTHCOM	Northern Command
NRC	National Research Council
NSCWMD	National Strategy to Combat Weapons of Mass Destruction
NTA	Non-Traditional Agent

O

O&S	Operations and Sustainment
OASD(HA)	Office of the Assistant Secretary of Defense for Health Affairs
OATSD(NCB)	Office of the Assistant to the Secretary of Defense for Nuclear and Chemical and Biological Defense Programs
OCONUS	Outside of Continental United States
ODATSD(CBD&CDP)	Office of the Deputy to the Secretary of Defense for Chemical and Biological Defense and Chemical Demilitarization Programs
OEF	Operation ENDURING FREEDOM
OIF	Operation IRAQI FREEDOM
OPCW	Organization for the Prohibition of Chemical Weapons
OSD	Office of the Secretary of Defense
OSTP	Office of Science and Technology Policy
OUSD(AT&L)	Office of the Under Secretary of Defense for Acquisition, Technology and Logistics

P

PA	Project Agreement
PAIO	Program Analysis and Integration Office
PME	Professional Military Education
POM	Program Objective Memorandum
POR	Program of Record

Q

QDR	Quadrennial Defense Review

R

R&D	Research and Development
RAV	Readiness Assistance Visit
RD3C	Rapid Drug Discovery and Development Capability Concept
RDA	Research, Development, and Acquisition
RDD	Radiological Dispersal Device
RED	Radiological Exposure Device
RDT&E	Research, Development, Test, and Evaluation
RIP	Readiness Improvement Program
RSDL	Reactive Skin Decontamination Lotion
RTO	Research and Technology Organization

S

S&T	Science and Technology
SA(CBD&CDP)	Special Assistant for Chemical and Biological Defense and Chemical Demilitarization Programs
SCC-WMD	Strategic Command Center for Combating Weapons of Mass Destruction
SCG	Security Classification Guidance
SDD	System Development and Demonstration
SLAM	Strategic Logistics Asset Management
SLS	Senior Leader Seminar
SNS	Strategic National Stockpile
SME	Subject Matter Expert
SoS	System of Systems
SRF	Sample Receipt Facility
SSA	Software Support Activity

T

T&E	Test and Evaluation
T&R	Training and Readiness
TAS	Threat Agent Science
TAV	Total Asset Visibility
TEI	Technical Equipment Inspection Program
TEO	Test and Evaluation Office
TESWG	Test, Evaluation, and Simulation Working Group
TIC	Toxic Industrial Chemical
TIIS	Test and Evaluation Infrastructure Investment Strategy
TIM	Toxic Industrial Material
TMTI	Transformational Medical Technologies Initiative
TP	Technical Publication
TRAC	Threat Reduction Advisory Committee
TS	Technical Secretariat
TSWG	Technical Support Working Group
TTA	Technology Transition Agreement
TTCP	The Technology Cooperation Program
TTP	Tactics, Techniques, and Procedures
TTX	Tabletop Exercise

U

UCS	Unified Command Suite
UID	Unit Identification
U.N.	United Nations
UNS	Urgent Needs Statement
USACBRNS	United States Army Chemical, Biological, Radiological, and Nuclear School
USAMRIID	U.S. Army Medical Research Institute for Infectious Diseases
U.S.C.	United States Code
USD(AT&L)	Under Secretary of Defense for Acquisition, Technology and Logistics
USSTRATCOM	U.S. Strategic Command

V

VBSS	Visit, Board, Search, and Seizure

W

WACS	Weapons of Mass Destruction Aerial Collection
WMD	Weapons of Mass Destruction
WMD-CST	Weapons of Mass Destruction Civil Support Teams
WSLAT	Whole System Live Agent Test

X

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Y

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Z

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DEPARTMENT OF DEFENSE
UNITED STATES OF AMERICA
CBDP